Air Quality Analysis Supporting Documentation

The Proposed Action is to recapitalize the T-38C Talon flight training program at Sheppard Air Force Base (AFB), Texas, with T-7A Red Hawk aircraft. The Department of the Air Force (DAF) is considering three alternative ways to implement the Proposed Action (i.e., Alternatives 1, 2, and 3), and the No Action Alternative. Recapitalization would entail introduction of T-7A aircraft and flight operations at Sheppard AFB and associated special use airspace (Hollis, Washita, Westover 1 and Westover 2 Military Operating Areas [MOAs]; Military Training Routes [MTRs] IR-103, VR-158, VR-159, VR-1141, VR-1142, VR-1143, and VR-1146; and Falcon Range [R-5601]) to replace all T-38C aircraft assigned to the installation; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and 16 construction and renovation projects to address operations, support, and maintenance facility requirements.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T-38C aircraft. Alternative 2 also would result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft, and T-7A operations would be approximately 21 percent greater than Alternative 1. Alternative 3 also includes construction of additional aircraft shelters for the additional T-7A aircraft. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The Air Conformity Applicability Model (ACAM) version 5.0.24a was used to perform an analysis to assess the potential air quality impacts associated with the Proposed Action and alternatives. This document provides the ACAM results.

The two regions of influence (ROIs) for this air quality assessment are the Sheppard AFB ROI, within which all Sheppard AFB airfield operations (i.e., takeoffs, landings, and closed patterns) and construction actions would occur, and the SUA ROI, which contains the MOAs, MTRs, and Falcon Range, within which T-7A SUA operations would occur.

The mixing zone is a three-dimensional vertical column of air generally up to 3,000 feet above ground level (AGL) where criteria pollutant emissions, due to atmospheric mixing and dispersion, have the greatest potential to directly impact human health and air quality. As such, criteria pollutant emissions are evaluated within and up to 3,000 feet. For the Proposed Action, no aircraft operations below 3,000 feet AGL occur within Hollis, Washita, Westover 1, and Westover 2 MOAs; therefore, these areas were not considered for criteria pollutant emissions.

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere and include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tropospheric ozone, and several fluorinated and chlorinated gaseous compounds. CO_2, CH_4, and N_2O account for

99.6 percent of all direct GHG emissions in the U.S.[1] GHGs at any altitude, including those above the mixing zone, can contribute to a warming effect within the atmosphere. As such, GHG emissions are evaluated at all altitudes.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

This document is presented in two sections corresponding to two separate air quality ROIs based on regulatory requirements and the physical spatial distribution of the emissions sources associated with the Proposed Action and alternatives. The two ROIs are as follows:

- **Sheppard AFB ROI** – includes all Sheppard AFB airfield operations, personnel changes, construction actions, and facility operations.

  Counties included:

  Wichita County, TX

- **SUA ROI** – includes aircraft operations within Hollis, Washita, Westover 1, and Westover 2 MOAs; IR-103, VR-158, VR-159, VR-1141, VR-1142, VR-1143, and VR-1146; and R-5601.

  Counties included:

  Atoka County, OK
  Beckham County, OK
  Bryan County, OK
  Caddo County, OK
  Carter County, OK
  Coal County, OK
  Comanche County, OK
  Garvin County, OK
  Grady County, OK
  Greer County, OK
  Harmon County, OK
  Jackson County, OK
  Jefferson County, OK
  Johnston County, OK

[1] USEPA. 2024. Greenhouse Gas Reporting Program (GHGRP) Emissions by GHG. October 15, 2024. Available online: <https://www.epa.gov/ghgreporting/ghgrp-emissions-ghg>. Accessed January 3, 2025.

Kiowa County, OK
Love County, OK
Marshall County, OK
Murray County, OK
Pontotoc County, OK
Roger Mills County, OK
Stephens County, OK
Tillman County, OK
Washita County, OK
Archer County, TX
Baylor County, TX
Bosque County, TX
Callahan County, TX
Childress County, TX
Clay County, TX
Collingsworth County, TX
Comanche County, TX
Cooke County, TX
Cottle County, TX
Denton County, TX
Dickens County, TX
Donley County, TX
Eastland County, TX
Erath County, TX
Foard County, TX
Gray County, TX
Grayson County, TX
Hall County, TX
Hamilton County, TX
Hardeman County, TX
Haskell County, TX
Hood County, TX
Jack County, TX
Jones County, TX
Kent County, TX
King County, TX
Knox County, TX
Montague County, TX
Motley County, TX
Palo Pinto County, TX
Shackelford County, TX
Somervell County, TX
Stephens County, TX
Stonewall County, TX
Throckmorton County, TX
Wheeler County, TX
Wichita County, TX
Wilbarger County, TX
Wise County, TX
Young County, TX

Table 1 outlines the attainment status for the counties within the Sheppard AFB and SUA ROIs. Based on compliance with NAAQS, the General Conformity Rule is potentially applicable to emissions of NO_X and VOC from aircraft operations within a portion of the SUA ROI, specifically within VR-1146. To get a better understanding of the potential for the *de minimis* level thresholds to be exceeded in the applicable nonattainment area, a separate emissions assessment was performed to isolate criteria pollutant emissions from aircraft operations within VR-1146.

Table 1. National Ambient Air Quality Standards Attainment Status for All Counties within the Sheppard AFB and SUA ROIs

County	Airspace	Attainment Status	*de minimis* Threshold
Atoka County, OK	VR-1146	Unclassifiable/Attainment	None
Beckham County, OK	Hollis MOA, VR-1141, VR-1142	Unclassifiable/Attainment	None
Bryan County, OK	VR-1146	Unclassifiable/Attainment	None
Caddo County, OK	Washita MOA, R-5601	Unclassifiable/Attainment	None
Carter County, OK	VR-1146	Unclassifiable/Attainment	None
Coal County, OK	VR-1146	Unclassifiable/Attainment	None
Comanche County, OK	Washita MOA, R-5601	Unclassifiable/Attainment	None
Garvin County, OK	VR-1146	Unclassifiable/Attainment	None
Grady County, OK	Washita MOA, VR-1146	Unclassifiable/Attainment	None
Greer County, OK	Hollis MOA	Unclassifiable/Attainment	None
Harmon County, OK	Hollis MOA	Unclassifiable/Attainment	None
Jackson County, OK	Hollis MOA	Unclassifiable/Attainment	None
Jefferson County, OK	VR-1146	Unclassifiable/Attainment	None
Johnston County, OK	VR-1146	Unclassifiable/Attainment	None
Kiowa County, OK	Washita MOA, R-5601, IR-103	Unclassifiable/Attainment	None
Love County, OK	VR-1146	Unclassifiable/Attainment	None
Marshall County, OK	VR-1146	Unclassifiable/Attainment	None
Murray County, OK	VR-1146	Unclassifiable/Attainment	None
Pontotoc County, OK	VR-1146	Unclassifiable/Attainment	None
Roger Mills County, OK	VR-1141, VR-1142	Unclassifiable/Attainment	None
Stephens County, OK	VR-1146	Unclassifiable/Attainment	None
Tillman County, OK	IR-103	Unclassifiable/Attainment	None
Washita County, OK	Washita MOA	Unclassifiable/Attainment	None
Archer County, TX	Westover 1 MOA, IR-103, VR-158, VR-159, VR-1143	Unclassifiable/Attainment	None
Baylor County, TX	Westover 1 MOA, IR-103, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Bosque County, TX	VR-158	Unclassifiable/Attainment	None
Callahan County, TX	VR-1143	Unclassifiable/Attainment	None

County	Airspace	Attainment Status	*de minimis* Threshold
Childress County, TX	Hollis MOA, Westover 2 MOA, VR-1143	Unclassifiable/Attainment	None
Clay County, TX	IR-103, VR-158, VR-1146	Unclassifiable/Attainment	None
Collingsworth County, TX	Hollis MOA, VR1141, VR-1142	Unclassifiable/Attainment	None
Comanche County, TX	VR-158	Unclassifiable/Attainment	None
Cooke County, TX	VR-1146	Unclassifiable/Attainment	None
Cottle County, TX	Westover 2 MOA, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Denton County, TX	VR-1146	2008 8-hour O_3 standard (75 ppb): Severe nonattainment	NO_X: 25 tpy VOC: 25 tpy
		2015 8-hour O_3 standard (70 ppb): Serious nonattainment	NOX: 50 tpy VOC: 50 tpy
Dickens County, TX	Westover 2 MOA, VR-1143	Unclassifiable/Attainment	None
Donley County, TX	VR-1141, VR-1142	Unclassifiable/Attainment	None
Eastland County, TX	VR-158, VR-1143	Unclassifiable/Attainment	None
Erath County, TX	VR-158	Unclassifiable/Attainment	None
Foard County, TX	Westover 1 MOA, Westover 2 MOA, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Gray County, TX	VR-1141, V-1142	Unclassifiable/Attainment	None
Grayson County, TX	VR-1146	Unclassifiable/Attainment	None
Hall County, TX	Westover 2 MOA, VR-1141, VR 1142	Unclassifiable/Attainment	None
Hamilton County, TX	VR-158	Unclassifiable/Attainment	None
Hardeman County, TX	Hollis MOA, Westover 1 MOA, Westover 2 MOA, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Haskell County, TX	Westover 1 MOA, Westover 2 MOA, VR-159, VR-1143	Unclassifiable/Attainment	None
Hood County, TX	VR-158	Unclassifiable/Attainment	None
Jack County, TX	IR-103, VR-158, VR-1143, VR-1146	Unclassifiable/Attainment	None
Jones County, TX	Westover 2 MOA, VR-159, VR-1143	Unclassifiable/Attainment	None
Kent County, TX	VR-1143	Unclassifiable/Attainment	None
King County, TX	Westover 2 MOA, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Knox County, TX	Westover 1 MOA, Westover 2 MOA, VR-159, VR-1141, VR-1142	Unclassifiable/Attainment	None
Montague County, TX	VR-1146	Unclassifiable/Attainment	None

County	Airspace	Attainment Status	*de minimis* Threshold
Motley County, TX	Westover 2 MOA, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Palo Pinto County, TX	VR-158, VR-1143	Unclassifiable/Attainment	None
Shackelford County, TX	Westover 2 MOA, VR-159, VR-1143	Unclassifiable/Attainment	None
Somervell County, TX	VR-158	Unclassifiable/Attainment	None
Stephens County, TX	VR-158, VR-159, VR-1143	Unclassifiable/Attainment	None
Stonewall County, TX	Westover 2 MOA, VR-159, VR-1143	Unclassifiable/Attainment	None
Throckmorton County, TX	Westover 1 MOA, Westover 2 MOA, VR-159, VR-1143	Unclassifiable/Attainment	None
Wheeler County, TX	VR-1141, VR-1142	Unclassifiable/Attainment	None
Wichita County, TX	Sheppard AFB, IR-103, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Wilbarger County, TX	Westover 1 MOA, IR-103, VR-159, VR-1141, VR-1142, VR-1143	Unclassifiable/Attainment	None
Wise County, TX	VR-1146	2008 8-hour O_3 standard (75 ppb): Severe nonattainment	NOX: 25 tpy VOC: 25 tpy
		2015 8-hour O_3 standard (70 ppb): Serious nonattainment	NO_X: 50 tpy VOC: 50 tpy
Young County, TX	IR-103, VR-158, VR-159, VR-1143	Unclassifiable/Attainment	None

Sources: (1) 40 Code of Federal Regulations (CFR) § 93.153; (2) 40 CFR § 81.337; (3) 40 CFR § 81.344; (4) U.S. Environmental Protection Agency. 2025. Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants, for Texas and Oklahoma. As of March 31, 2025. Available online: <https://www3.epa.gov/airquality/greenbook/anayo_tx.html>. Accessed April 23, 2025.

The emission factors presented in this report are embedded within ACAM. All algorithms, emission factors, and methodologies used in the model are described in detail in the the following DAF documents: (1) *Air Emissions Guide for Air Force Stationary Sources*, (2) *Air Emissions Guide for Air Force Mobile Sources*, and (3) *Air Emissions Guide for Air Force Transitory Sources*. Additional data and methodology used to prepare the ACAM reports are below.

Time in Mode (TIM) Summary for T-7A and T-38C Aircraft Within the ROIs

Table 2. TIM Summary for Sheppard AFB ROI

	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Sheppard AFB T-7A TIM Summary					
LTO Flight	0.00	0.02	0.68	0.99	5.18
LTO Taxi	17.16	0.00	0.00	0.00	0.00
Total LTO	**17.16**	**0.02**	**0.68**	**0.99**	**5.18**
Closed Patterns	**0.00**	**0.00**	**0.34**	**1.15**	**1.59**
Sheppard AFB T-38C TIM Summary					
LTO Flight	0.00	0.33	0.37	0.99	5.18
LTO Taxi	18.56	0.00	0.00	0.00	0.00
Total LTO	**18.56**	**0.33**	**0.37**	**0.99**	**5.18**
Closed Patterns	**0.00**	**0.00**	**0.34**	**1.15**	**1.59**

Key: AB = afterburner; LTO = landing and takeoff cycle; mil = military; min = minutes

Table 3. TIM Summary for SUA ROI

	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Hollis MOA					
Total LFP	N/A	N/A	N/A	N/A	N/A
Total DC	0.00	0.00	6.00	4.50	19.50
Washita MOA					
Total LFP	N/A	N/A	N/A	N/A	N/A
Total DC	0.00	0.00	7.20	5.40	23.40
Westover 1 MOA					
Total LF	N/A	N/A	N/A	N/A	N/A
Total DC	0.00	0.00	9.00	3.60	23.40
Westover 2 MOA					
Total LFP	N/A	N/A	N/A	N/A	N/A
Total DC	0.00	0.00	7.50	10.00	7.50

	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
IR-103					
Total LFP	0.00	0.00	20.00	0.00	0.00
Total DC	0.00	0.00	20.00	0.00	0.00
VR-158					
Total LFP	0.00	0.00	35.00	0.00	0.00
Total DC	0.00	0.00	35.00	0.00	0.00
VR-159					
Total LFP	0.00	0.00	34.00	0.00	0.00
Total DC	0.00	0.00	34.00	0.00	0.00
VR-1141					
Total LFP	0.00	0.00	36.00	0.00	0.00
Total DC	0.00	0.00	36.00	0.00	0.00
VR-1142					
Total LFP	0.00	0.00	36.00	0.00	0.00
Total DC	0.00	0.00	36.00	0.00	0.00
VR-1143					
Total LFP	0.00	0.00	41.00	0.00	0.00
Total DC	0.00	0.00	41.00	0.00	0.00
VR-1146					
Total LFP	0.00	0.00	38.00	0.00	0.00
Total DC	0.00	0.00	38.00	0.00	0.00
R-5601					
Total LFP	0.00	0.00	0.00	0.43	0.40
Total DC	0.00	0.00	0.00	0.43	0.40

Key: AB = afterburner; DC = destination cycle; LFP = low flight pattern; mil = military; min = minutes; N/A = not applicable

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Sheppard AFB ROI

Sheppard AFB ROI: Alternative 1 ACAM Report

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction

would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
__X__ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2031

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.904	250	No
NOx	10.892	250	No
CO	17.239	250	No
SOx	0.028	250	No
PM 10	16.479	250	No
PM 2.5	0.316	250	No
Pb	0.000	25	No
NH3	0.031	250	No

2032

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.734	250	No
NOx	4.898	250	No
CO	7.971	250	No
SOx	0.014	250	No
PM 10	0.152	250	No
PM 2.5	0.130	250	No
Pb	0.000	25	No
NH3	0.019	250	No

2033

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.163	250	No
NOx	0.255	250	No
CO	1.851	250	No
SOx	0.003	250	No
PM 10	0.027	250	No
PM 2.5	0.019	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	13.209	250	No
NOx	42.803	250	No
CO	-56.437	250	No
SOx	1.857	250	No
PM 10	-1.708	250	No
PM 2.5	-1.528	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	45.916	250	No
NOx	177.183	250	No
CO	-498.304	250	No
SOx	5.879	250	No
PM 10	-15.016	250	No
PM 2.5	-13.546	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	70.341	250	No
NOx	297.217	250	Yes
CO	-991.656	250	No
SOx	8.634	250	No
PM 10	-29.472	250	No
PM 2.5	-26.602	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	67.221	250	No
NOx	311.317	250	Yes
CO	-1160.110	250	No
SOx	8.011	250	No
PM 10	-34.223	250	No
PM 2.5	-30.901	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	67.221	250	No
NOx	311.317	250	Yes
CO	-1160.110	250	No
SOx	8.011	250	No
PM 10	-34.223	250	No
PM 2.5	-30.901	250	No
Pb	0.000	25	No
NH3	0.000	250	No

The steady state estimated annual net emissions associated with this action exceed the insignificance indicators, indicating a potential for a significant impact to air quality. Therefore, the ACAM analysis is inconclusive and further air quality impact assessment is needed.

Carolyn Hein, Contractor — Apr 23 2025

Name, Title — **Date**

Sheppard AFB ROI: Alternative 1 ACAM Detail Report

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2031

- Action Purpose and Need:
The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:
The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating

those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Ground-Based Training System (GBTS) Facility
3.	Heating	GBTS Facility (Heating)
4.	Construction / Demolition	Maintenance Hangar/Unit Maintenance Training (UMT) Facility
5.	Heating	UMT Facility (Heating)
6.	Construction / Demolition	Ramp Expansion
7.	Construction / Demolition	Hush House Pad
8.	Construction / Demolition	T-7A Shelters
9.	Construction / Demolition	Addition to Egress Shop
10.	Heating	Addition to Egress Shop (Heating)
11.	Construction / Demolition	Construct Jet Blast Deflectors
12.	Construction / Demolition	Airfield Improvements
13.	Paint Booth	Airfield Improvements (Painting)
14.	Construction / Demolition	Renovate Squad Operations 1
15.	Construction / Demolition	Renovate Squad Operations 2
16.	Construction / Demolition	Hangar Renovation
17.	Construction / Demolition	Remove Aboveground Service Modules of the CASS
18.	Construction / Demolition	Compass Rose & Trim Pad
19.	Paint Booth	Compass Rose & Trim Pad (Painting)
20.	Construction / Demolition	Munitions Storage for T-7A
21.	Construction / Demolition	Hammerhead Expansion
22.	Construction / Demolition	Support Mechanized Material Handling System (in T-7A parts Warehouse)
23.	Personnel	Transitional Increase of 100 Personnel
24.	Aircraft	2034 Add T-7As and LTOs
25.	Aircraft	2034 Add T-7A CPs
26.	Aircraft	2034 Remove T-38C LTOs
27.	Aircraft	2034 Remove T-38C CPs
28.	Aircraft	2035 Add T-7As and LTOs
29.	Aircraft	2035 Add T-7A CPs
30.	Aircraft	2035 Remove T-38Cs and LTOs
31.	Aircraft	2035 Remove T-38C CPs
32.	Aircraft	2036 Add T-7As and LTOs
33.	Aircraft	2036 Add T-7A CPs
34.	Aircraft	2036 Remove T-38Cs and LTOs
35.	Aircraft	2036 Remove T-38C CPs
36.	Aircraft	2037 Add T-7A LTOs
37.	Aircraft	2037 Add T-7A CPs
38.	Aircraft	2037 Remove T-38Cs and LTOs
39.	Aircraft	2037 Remove T-38C CPs

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ground-Based Training System (GBTS) Facility

- Activity Description:
Construction of the GBTS facility would occur over a 2-year period from January 2031 through December 2032. Construction would include renovation of an existing facility (estimated at 30,000 SF) and construction of a 16,000 SF addition. Associated parking would be constructed along Avenue J (approx. 100,000 SF).

Site grading would occur on the site for new construction and pavements (approx. 116,000 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

It was assumed 25 percent of the total square footage of the renovations (approx. 30,000 SF) would be construction to equate the renovations (30,000 SF * 0.25 = 7,500 SF). New construction would include a 16,000 SF addition. Total construction for the GBTS facility was estimated at 37,500 SF. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,000 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 100,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.767447
SO_x	0.004973
NO_x	1.847399
CO	2.857429

Pollutant	Total Emissions (TONs)
PM 10	2.393357
PM 2.5	0.048628
Pb	0.000000
NH_3	0.005399

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.019673
N_2O	0.007686

Pollutant	Total Emissions (TONs)
CO_2	504.564739
CO_2e	507.152392

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 116000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)

WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 37500

Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1

Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 100000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: GBTS Facility (Heating)

- Activity Description:
Heating/cooling for the GBTS facility addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
GBTS Facility Addition – 16,000 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.002397
SO_x	0.000261
NO_x	0.043581
CO	0.036608

Pollutant	Emissions Per Year (TONs)
PM 10	0.003312
PM 2.5	0.003312
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000985
N_2O	0.000985

Pollutant	Emissions Per Year (TONs)
CO_2	52.305423
CO_2e	52.594008

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 16000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0572

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

3.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Maintenance Hangar/Unit Maintenance Training (UMT) Facility

- Activity Description:

Construction of the UMT facility (46,500 SF) would occur over a 2-year period from January 2031 through December 2032. An approximately 15,000 SF parking area would also be constructed.

Site grading would occur on the site for new construction and pavements (approx. 61,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

Construction would include the 46,500-SF UMT facility. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,500 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 15,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.759672
SO_x	0.004743
NO_x	1.757835
CO	2.698828

Pollutant	Total Emissions (TONs)
PM 10	1.305911
PM 2.5	0.045534
Pb	0.000000
NH_3	0.005541

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.018675
N_2O	0.008118

Pollutant	Total Emissions (TONs)
CO_2	482.352228
CO_2e	485.026336

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 61500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**

Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 46500
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887

MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46500
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

4.5 Paving Phase

4.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

5. Heating

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: UMT Facility (Heating)

- Activity Description:
Heating/cooling for the UMT facility would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
UMT Facility – 46,500 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007892
SO_x	0.000861
NO_x	0.143486
CO	0.120528

Pollutant	Emissions Per Year (TONs)
PM 10	0.010905
PM 2.5	0.010905
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003243
N_2O	0.003243

Pollutant	Emissions Per Year (TONs)
CO_2	172.210119
CO_2e	173.160253

5.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 46500
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0648

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

5.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

5.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ramp Expansion

- Activity Description:

Ramp expansion would include grading and paving new ramp areas. Activities would occur over a 2-year period starting in January 2031.

Site grading would occur on the entire area (approx. 60,000 SF). Site grading would begin in January 2031 and last approximately 12 months.

Paving would occur on approximately 60,000 SF. Paving would begin January 2032 and last approximately 12 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.223808
SO_x	0.004137
NO_x	1.747959
CO	2.696316

Pollutant	Total Emissions (TONs)
PM 10	7.235707
PM 2.5	0.066310
Pb	0.000000
NH_3	0.003490

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.017588
N_2O	0.003891

Pollutant	Total Emissions (TONs)
CO_2	439.110329
CO_2e	440.634041

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 60000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)

20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

6.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 60000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hush House Pad

- Activity Description:
Construction of the hush house pad (27,500 SF) would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the entire site (27,500 SF). Site grading would begin in January 2031 and last approximately 4 months.

Trenching for the reinforced concrete and utilities would occur over the entire site (27,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in May 2031 and last approximately 4 months.

Construction of the new hush house pad would total approximately 27,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in September 2031 and last approximately 16 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 0
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.191392
SO_x	0.003579
NO_x	1.526256
CO	2.354629

Pollutant	Total Emissions (TONs)
PM 10	2.239433
PM 2.5	0.045659
Pb	0.000000
NH_3	0.003939

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.014222
N_2O	0.003307

Pollutant	Total Emissions (TONs)
CO_2	356.767753
CO_2e	358.042202

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.2 Trenching/Excavating Phase

7.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4
Number of Days: 0

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0

Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690

HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.3 Building Construction Phase

7.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

7.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 27500
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Concrete/Industrial Saws Composite	1	8
Generator Sets Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	0
Plate Compactors Composite	1	8
Rollers Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559

Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: T-7A Shelters

- Activity Description:
Construction of 108 aircraft shelters (sunshades) would occur over a 2-year period from January 2031 through December 2032.

Demolition would be required for the existing T-38C shelters. Demolition would include removal of 131 sunshades totaling approximately 295,000 SF. Demolition would begin in January 2031 and last approximately 12 months.

Construction would include installation of 108 T-7A sunshades totaling approximately 245,000 SF. The height of all sunshades were assumed to be 15 feet. Construction would begin in January 2032 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.197240
SO_x	0.004852
NO_x	1.692855
CO	2.765679

Pollutant	Total Emissions (TONs)
PM 10	0.983944
PM 2.5	0.041995
Pb	0.000000
NH_3	0.011037

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.020087
N_2O	0.022457

Pollutant	Total Emissions (TONs)
CO_2	573.047860
CO_2e	579.561591

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 295000
Height of Building to be demolished (ft): 15

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546

HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1\ yd^3 / 27\ ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Building Construction Phase

8.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

8.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 245000
Height of Building (ft): 15
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	2	7
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16757	0.00487	1.25709	1.55759	0.05276	0.04854
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19055	0.00487	1.77383	3.55935	0.05272	0.04850
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53211	0.00793	4.25580	2.83928	0.16416	0.15103
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.34949	0.00735	3.21107	4.36083	0.03339	0.03072

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30495	570.25522
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30587	570.25615

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop

- Activity Description:
Construction of the addition to the egress shop would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the site of the addition, 3,400 SF. Site grading would begin in January 2031 and last approximately 1 month.

Construction of the egress shop addition would total approximately 3,400 SF. The height of the addition was assumed to be 20 feet. Construction would begin in February 2031 and last approximately 22 months.

Architectural coatings would be applied to the addition, totaling 3,400 SF. Architectural coating application would begin in December 2032 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.143878
SO_x	0.002583
NO_x	0.805008
CO	1.473874

Pollutant	Total Emissions (TONs)
PM 10	0.063196
PM 2.5	0.026319
Pb	0.000000
NH_3	0.002309

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011335
N_2O	0.002639

Pollutant	Total Emissions (TONs)
CO_2	283.411958
CO_2e	284.428557

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613

HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.2 Building Construction Phase

9.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 22
Number of Days: 0

9.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3400
Height of Building (ft): 20
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

9.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.3 Architectural Coatings Phase

9.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 1
Number of Days: 0

9.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 3400
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539

LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

10. Heating

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop (Heating)

- Activity Description:
Heating/cooling for the new addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
Addition to the Egress Shop – 3,400 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000845
SO_x	0.000092
NO_x	0.015365
CO	0.012906

Pollutant	Emissions Per Year (TONs)
PM 10	0.001168
PM 2.5	0.001168
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000347
N_2O	0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	18.440634
CO_2e	18.542376

10.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 3400
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0949

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

10.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

10.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Jet Blast Deflectors

- Activity Description:
Construction of the jet blast deflectors would occur over a 2-year period from January 2031 through December 2032.

Construction of the deflectors would total approximately 2,000 SF. The height of the deflectors was assumed to be 12 feet. Construction would begin in January 2031 and last approximately 24 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.101013
SO_x	0.002586
NO_x	0.774680
CO	1.461830

Pollutant	Total Emissions (TONs)
PM 10	0.027217
PM 2.5	0.024360
Pb	0.000000
NH_3	0.002352

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011342
N_2O	0.002520

Pollutant	Total Emissions (TONs)
CO_2	283.219970
CO_2e	284.205261

11.1 Building Construction Phase

11.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 24
Number of Days: 0

11.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

11.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

11.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements

- Activity Description:

Airfield improvements would include airfield markings, installation of mooring and anchor rods, replacing the aircraft arresting system, and removing aboveground service modules of the Centralized Aircraft Support System (CASS). Activities would occur over a 1-year period starting in January 2031 (painting activities would occur from September through December 2031 and are captured in a separate Paint Booth activity).

Trenching/excavation for the mooring and anchor rods was estimated to occur on 100 SF. Excavation for replacing the arresting system may be required (approx. 1,000 SF). Total excavation was estimated at 1,100 SF. Excavation would begin in January 2031 and last approximately 2 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

The construction activity was used to characterize removal of existing airfield markings. Grinders would likely be used to remove existing paint, estimated at 50,000 SF. Paint removal would begin in March 2031 and last approximately 5 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 7
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.033345
SO_x	0.000641
NO_x	0.279630
CO	0.393083

Pollutant	Total Emissions (TONs)
PM 10	0.027621
PM 2.5	0.005028
Pb	0.000000
NH_3	0.000738

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.002210
N_2O	0.000640

Pollutant	Total Emissions (TONs)
CO_2	56.045595
CO_2e	56.277179

12.1 Trenching/Excavating Phase

12.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration

Number of Month: 2
Number of Days: 0

12.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1100
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

12.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

12.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12.2 Building Construction Phase

12.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 5
Number of Days: 0

12.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 50000
Height of Building (ft): 1
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

12.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702

MC	0.10118	0.00284	394.03643	397.62186

12.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

13. Paint Booth

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements (Painting)

- Activity Description:
Painting activities would be a continuation of the airfield improvements construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in August 2031 and last approximately 5 months.

- Activity Start Date
Start Month: 8
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.011873
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

13.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

13.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 1

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 165,000 SF) would be construction to equate the renovations (165,000 SF * 0.25 = 41,250 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (165,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12

End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.036021
SO_x	0.002744
NO_x	0.982507
CO	1.500633

Pollutant	Total Emissions (TONs)
PM 10	0.027778
PM 2.5	0.023494
Pb	0.000000
NH_3	0.003633

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010656
N_2O	0.005897

Pollutant	Total Emissions (TONs)
CO_2	280.268179
CO_2e	282.129405

14.1 Building Construction Phase

14.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

14.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 41250
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

14.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

14.2 Architectural Coatings Phase

14.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

14.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 165000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

14.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 2

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 100,000 SF) would be construction to equate the renovations (100,000 SF * 0.25 = 25,000 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (100,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.281448
SO_x	0.002710
NO_x	0.968997
CO	1.488778

Pollutant	Total Emissions (TONs)
PM 10	0.026657
PM 2.5	0.023040
Pb	0.000000
NH_3	0.003041

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010474
N_2O	0.004443

Pollutant	Total Emissions (TONs)
CO_2	270.068383
CO_2e	271.539060

15.1 Building Construction Phase

15.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

15.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 25000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

15.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

15.2 Architectural Coatings Phase

15.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

15.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 100000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

15.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hangar Renovation

- Activity Description:
Modification of either Building 2404, 2406, 2408, or 2410 would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the hangar (approx. 40,000 SF) would be construction to equate the renovations (40,000 SF * 0.25 = 10,000 SF). The height of the hangar was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (40,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.575177
SO_x	0.002406
NO_x	0.881174
CO	1.389029

Pollutant	Total Emissions (TONs)
PM 10	0.022338
PM 2.5	0.019599
Pb	0.000000
NH_3	0.002494

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.009110
N_2O	0.002861

Pollutant	Total Emissions (TONs)
CO_2	231.143070
CO_2e	232.156290

16.1 Building Construction Phase

16.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

16.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 10000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

16.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

16.2 Architectural Coatings Phase

16.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

16.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 40000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

16.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

17. Construction / Demolition

17.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Remove Aboveground Service Modules of the CASS

- Activity Description:
Removal of T-38C CASS modules would occur over a 1-year period starting in January 2031.

It was assumed approximately 1,000 SF would be excavated and filled for CASS removal. Excavation would begin in January 2031 and last approximately 12 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.047432
SO_x	0.000912
NO_x	0.417206
CO	0.720250

Pollutant	Total Emissions (TONs)
PM 10	0.127785
PM 2.5	0.007411
Pb	0.000000
NH_3	0.001162

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.003996
N_2O	0.000890

Pollutant	Total Emissions (TONs)
CO_2	100.176741
CO_2e	100.524406

17.1 Trenching/Excavating Phase

17.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

17.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

17.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

17.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18. Construction / Demolition

18.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad

- Activity Description:
Repairs and preparation of existing aircraft pavement for a compass rose and trim pad would occur over aa 1-year period starting in January 2031 (compass rose painting activities would occur from November through December 2031 and are captured in a separate Paint Booth activity).

Site grading would occur on the site for the compass rose/trim pad and access road (approx. 30,000 SF). Site grading would begin in January 2031 and last approximately 3 months.

Excavation would occur over the entire site (30,000 SF). It was assumed excavated fill would be reused in place. Trenching would begin in April 2031 and last approximately 3 months.

Construction of the compass rose and trim pad would total approximately 15,000 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in July 2031 and last approximately 3 months.

Paving for the access road would occur on approximately 15,000 SF. Paving would begin in October 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.068650
SO_x	0.001254
NO_x	0.553532
CO	0.812319

Pollutant	Total Emissions (TONs)
PM 10	1.809833
PM 2.5	0.017326
Pb	0.000000
NH_3	0.001088

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005099
N_2O	0.001213

Pollutant	Total Emissions (TONs)
CO_2	127.632549
CO_2e	128.096865

18.1 Site Grading Phase

18.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374

LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.2 Trenching/Excavating Phase

18.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.3 Building Construction Phase

18.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1

Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 15000
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

18.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.4 Paving Phase

18.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

18.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

19. Paint Booth

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad (Painting)

- Activity Description:
Painting activities would be a continuation of the compass rose & trim pad construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in November 2031 and last approximately 2 months.

- Activity Start Date
Start Month: 11
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.004749
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

19.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

19.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

20. Construction / Demolition

20.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Munitions Storage for T-7A

- Activity Description:
Construction of the concrete pad for munitions storage would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,600 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for the concrete pad would occur over the entire site (3,600 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the pad would total approximately 3,600 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582613
CO	0.932667

Pollutant	Total Emissions (TONs)
PM 10	0.165142
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001377

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001309

Pollutant	Total Emissions (TONs)
CO_2	144.008411
CO_2e	144.516483

20.1 Site Grading Phase

20.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.2 Trenching/Excavating Phase

20.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.3 Building Construction Phase

20.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

20.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3600
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

20.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21. Construction / Demolition

21.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hammerhead Expansion

- Activity Description:
Construction for the hammerhead expansion would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Excavation would occur over the entire site (3,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the hammerhead expansion would total approximately 3,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582599
CO	0.932655

Pollutant	Total Emissions (TONs)
PM 10	0.161162
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001376

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001308

Pollutant	Total Emissions (TONs)
CO_2	143.997949
CO_2e	144.505622

21.1 Site Grading Phase

21.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702

MC	0.10118	0.00284	394.03643	397.62186

21.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.2 Trenching/Excavating Phase

21.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.3 Building Construction Phase

21.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

21.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3500
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

21.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

22. Construction / Demolition

22.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Support Mechanized Material Handling System (in T-7A parts Warehouse)

- Activity Description:
Renovations for interior electrical support would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 10,000 SF) would be construction to equate the renovations (10,000 SF * 0.25 = 2,500 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.050581
SO_x	0.001297
NO_x	0.389086
CO	0.732447

Pollutant	Total Emissions (TONs)
PM 10	0.013753
PM 2.5	0.012239
Pb	0.000000
NH_3	0.001253

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005695
N_2O	0.001448

Pollutant	Total Emissions (TONs)
CO_2	142.928113
CO_2e	143.471229

22.1 Building Construction Phase

22.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

22.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2500
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

22.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

22.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

23. Personnel

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Transitional Increase of 100 Personnel

- Activity Description:
Increase of 100 personnel during the T-7A and T-38C transition period (i.e., 2033 through 2036). Assumed all personnel commute daily.

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2036

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.607366
SO_x	0.005903
NO_x	0.211956
CO	6.723078

Pollutant	Total Emissions (TONs)
PM 10	0.045211
PM 2.5	0.016428
Pb	0.000000
NH_3	0.088579

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.027749
N_2O	0.012380

Pollutant	Total Emissions (TONs)
CO_2	753.334934
CO_2e	757.394193

23.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 100
Civilian Personnel: 0
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

23.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

23.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25418	0.00210	0.06585	2.90895	0.01876	0.00647	0.04233
LDGT	0.20052	0.00286	0.09270	2.68756	0.01996	0.00714	0.03585
HDGV	0.52890	0.00655	0.29513	6.07732	0.04127	0.01931	0.08206
LDDV	0.09228	0.00124	0.14059	7.44001	0.02278	0.00874	0.01684
LDDT	0.07431	0.00115	0.12481	2.41221	0.01970	0.00705	0.01527
HDDV	0.05762	0.00390	1.37962	1.33933	0.12436	0.04792	0.06921
MC	2.54108	0.00304	0.60490	11.11798	0.03078	0.02161	0.05640

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01002	0.00438	267.46963	268.91076
LDGT	0.01058	0.00613	364.36705	366.28905
HDGV	0.03206	0.02033	834.70184	840.98717
LDDV	0.04934	0.00067	368.02625	369.58553
LDDT	0.02373	0.00098	344.66551	345.59058
HDDV	0.02092	0.16975	1164.86428	1210.43459
MC	0.09969	0.00284	394.07263	397.61557

23.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7As and LTOs

- Activity Description:
In 2034, add 28 T-7As and 2,646 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	20.537982
SO_x	1.590575
NO_x	19.785336
CO	65.957790

Pollutant	Emissions Per Year (TONs)
PM 10	1.215401
PM 2.5	1.111898
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.188406
N_2O	0.036142

Pollutant	Emissions Per Year (TONs)
CO_2	4651.541883
CO_2e	4666.394913

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	19.059971
SO_x	1.213310
NO_x	13.431044
CO	39.652896

Pollutant	Emissions Per Year (TONs)
PM 10	0.288689
PM 2.5	0.255386
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.146472
N_2O	0.027931

Pollutant	Emissions Per Year (TONs)
CO_2	3649.640288
CO_2e	3661.143321

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.162803
SO_x	0.290536
NO_x	3.943155
CO	25.784768

Pollutant	Emissions Per Year (TONs)
PM 10	0.574064
PM 2.5	0.515552
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.036575
N_2O	0.007136

Pollutant	Emissions Per Year (TONs)
CO_2	869.825578
CO_2e	872.740655

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.315208
SO_x	0.086729
NO_x	2.411136
CO	0.520126

Pollutant	Emissions Per Year (TONs)
PM 10	0.352647
PM 2.5	0.340960
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005359
N_2O	0.001075

Pollutant	Emissions Per Year (TONs)
CO_2	132.076016
CO_2e	132.510936

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2646
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 17.16
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99

Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24.4 Auxiliary Power Unit (APU)

24.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

24.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

24.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

24.5 Aircraft Engine Test Cell

24.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 28

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 3
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12

Military Duration (mins): 8
After Burner Duration (mins): 7

24.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

24.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

24.6 Aerospace Ground Equipment (AGE)

24.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 2646

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

24.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

24.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7A CPs

- Activity Description:
In 2034, add 11,074 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	2.708043
SO_x	1.514742
NO_x	24.495612
CO	4.348402

Pollutant	Emissions Per Year (TONs)
PM 10	0.172199
PM 2.5	0.147446
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.190688
N_2O	0.037203

Pollutant	Emissions Per Year (TONs)
CO_2	4534.939059
CO_2e	4550.137158

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	2.708043
SO_x	1.514742
NO_x	24.495612
CO	4.348402

Pollutant	Emissions Per Year (TONs)
PM 10	0.172199
PM 2.5	0.147446
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.190688
N_2O	0.037203

Pollutant	Emissions Per Year (TONs)
CO_2	4534.939059
CO_2e	4550.137158

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 11074
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Remove T-38C LTOs

- Activity Description:
In 2034, decrease T-38C LTOs by 2,315.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-8.168078
SO_x	-0.726629
NO_x	-1.216621
CO	-91.273668

Pollutant	Emissions Per Year (TONs)
PM 10	-2.214141
PM 2.5	-1.991854
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.091474
N_2O	-0.017847

Pollutant	Emissions Per Year (TONs)
CO_2	-2175.432134
CO_2e	-2182.722736

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-8.168078
SO_x	-0.726629
NO_x	-1.216621
CO	-91.273668

Pollutant	Emissions Per Year (TONs)
PM 10	-2.214141
PM 2.5	-1.991854
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.091474
N_2O	-0.017847

Pollutant	Emissions Per Year (TONs)
CO_2	-2175.432134
CO_2e	-2182.722736

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2315
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18

Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.37
Takeoff [After Burn] (mins):	0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26.4 Auxiliary Power Unit (APU)

26.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

26.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

26.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Remove T-38C CPs

- Activity Description:
In 2034, decrease T-38C LTOs by 9,690.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-2.031552
SO_x	-0.524430
NO_x	-0.516573
CO	-37.320118

Pollutant	Emissions Per Year (TONs)
PM 10	-0.908327
PM 2.5	-0.815034
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.066019
N_2O	-0.012880

Pollutant	Emissions Per Year (TONs)
CO_2	-1570.075827
CO_2e	-1575.337677

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.031552
SO_x	-0.524430
NO_x	-0.516573
CO	-37.320118

Pollutant	Emissions Per Year (TONs)
PM 10	-0.908327
PM 2.5	-0.815034
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.066019
N_2O	-0.012880

Pollutant	Emissions Per Year (TONs)
CO_2	-1570.075827
CO_2e	-1575.337677

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9690
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7As and LTOs

- Activity Description:
In 2035, add 48 T-7As and 10,143 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes

End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	75.438865
SO_x	5.019921
NO_x	60.128228
CO	196.876426

Pollutant	Emissions Per Year (TONs)
PM 10	3.390257
PM 2.5	3.125037
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.586607
N_2O	0.112086

Pollutant	Emissions Per Year (TONs)
CO_2	14605.670875
CO_2e	14651.798631

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	72.237190
SO_x	4.189398
NO_x	44.125845
CO	150.680151

Pollutant	Emissions Per Year (TONs)
PM 10	1.054332
PM 2.5	0.934220
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.503363
N_2O	0.095733

Pollutant	Emissions Per Year (TONs)
CO_2	12608.249917
CO_2e	12647.713205

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.993377
SO_x	0.498061
NO_x	6.759695
CO	44.202460

Pollutant	Emissions Per Year (TONs)
PM 10	0.984110
PM 2.5	0.883803
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.062700
N_2O	0.012233

Pollutant	Emissions Per Year (TONs)
CO_2	1491.129563
CO_2e	1496.126838

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.208299
SO_x	0.332462
NO_x	9.242689
CO	1.993815

Pollutant	Emissions Per Year (TONs)
PM 10	1.351814
PM 2.5	1.307014
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.020544
N_2O	0.004121

Pollutant	Emissions Per Year (TONs)
CO_2	506.291395
CO_2e	507.958588

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		10143
Number of Annual Trim Test(s) per Aircraft:		9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28.4 Auxiliary Power Unit (APU)

28.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

28.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

28.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

28.5 Aircraft Engine Test Cell

28.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 48

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 3
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

28.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

28.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

28.6 Aerospace Ground Equipment (AGE)

28.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 10143

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

28.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

28.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7A CPs

- Activity Description:
In 2035, add 42,452 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	10.381239
SO_x	5.806739
NO_x	93.903532
CO	16.669528

Pollutant	Emissions Per Year (TONs)
PM 10	0.660122
PM 2.5	0.565231
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.730998
N_2O	0.142618

Pollutant	Emissions Per Year (TONs)
CO_2	17384.615578
CO_2e	17442.877246

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	10.381239
SO_x	5.806739
NO_x	93.903532
CO	16.669528

Pollutant	Emissions Per Year (TONs)
PM 10	0.660122
PM 2.5	0.565231
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.730998
N_2O	0.142618

Pollutant	Emissions Per Year (TONs)
CO_2	17384.615578
CO_2e	17442.877246

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 48
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 42452
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38Cs and LTOs

- Activity Description:
By 2035, remove 28 T-38Cs and 11,577 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-42.956014
SO_x	-4.182744
NO_x	-17.069494
CO	-468.812745

Pollutant	Emissions Per Year (TONs)
PM 10	-12.816678
PM 2.5	-11.633533
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.502235
N_2O	-0.098115

Pollutant	Emissions Per Year (TONs)
CO_2	-11964.389456
CO_2e	-12004.452393

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-41.181976
SO_x	-3.719406
NO_x	-6.166981
CO	-462.586571

Pollutant	Emissions Per Year (TONs)
PM 10	-11.221798
PM 2.5	-10.094858
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.468228
N_2O	-0.091351

Pollutant	Emissions Per Year (TONs)
CO_2	-11135.414601
CO_2e	-11172.733104

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.394912
SO_x	-0.083873
NO_x	-0.353108
CO	-3.950478

Pollutant	Emissions Per Year (TONs)
PM 10	-0.051949
PM 2.5	-0.046878
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010559
N_2O	-0.002060

Pollutant	Emissions Per Year (TONs)
CO_2	-251.104848
CO_2e	-251.946384

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.379126
SO_x	-0.379465
NO_x	-10.549404
CO	-2.275697

Pollutant	Emissions Per Year (TONs)
PM 10	-1.542932
PM 2.5	-1.491797
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.023449
N_2O	-0.004703

Pollutant	Emissions Per Year (TONs)
CO_2	-577.870007
CO_2e	-579.772905

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 11577
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	18.56
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.37
Takeoff [After Burn] (mins):	0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30.4 Auxiliary Power Unit (APU)

30.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

30.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

30.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

30.5 Aircraft Engine Test Cell

30.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 56

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2

Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

30.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

30.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

30.6 Aerospace Ground Equipment (AGE)

30.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 11577

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

30.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

30.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38C CPs

- Activity Description:
By 2035, remove 48,450 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-10.157760
SO_x	-2.622152
NO_x	-2.582865
CO	-186.600592

Pollutant	Emissions Per Year (TONs)
PM 10	-4.541633
PM 2.5	-4.075170
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.330097
N_2O	-0.064402

Pollutant	Emissions Per Year (TONs)
CO_2	-7850.379135
CO_2e	-7876.688384

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-10.157760
SO_x	-2.622152
NO_x	-2.582865
CO	-186.600592

Pollutant	Emissions Per Year (TONs)
PM 10	-4.541633
PM 2.5	-4.075170
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.330097
N_2O	-0.064402

Pollutant	Emissions Per Year (TONs)
CO_2	-7850.379135
CO_2e	-7876.688384

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64

Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 48450
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7As and LTOs

- Activity Description:
In 2036, add 32 T-7As and 9,482 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	69.808902
SO_x	4.459074
NO_x	52.800411
CO	171.905869

Pollutant	Emissions Per Year (TONs)
PM 10	2.894068
PM 2.5	2.674668
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.518958
N_2O	0.099041

Pollutant	Emissions Per Year (TONs)
CO_2	12954.155024
CO_2e	12994.931819

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	67.350428
SO_x	3.816238
NO_x	39.653587
CO	140.573681

Pollutant	Emissions Per Year (TONs)
PM 10	0.974276
PM 2.5	0.863628
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.457952
N_2O	0.087034

Pollutant	Emissions Per Year (TONs)
CO_2	11486.771300
CO_2e	11522.658033

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.328918
SO_x	0.332041
NO_x	4.506463
CO	29.468307

Pollutant	Emissions Per Year (TONs)
PM 10	0.656073
PM 2.5	0.589202
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.041800
N_2O	0.008155

Pollutant	Emissions Per Year (TONs)
CO_2	994.086375
CO_2e	997.417892

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.129556
SO_x	0.310796
NO_x	8.640360
CO	1.863881

Pollutant	Emissions Per Year (TONs)
PM 10	1.263719
PM 2.5	1.221838
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019205
N_2O	0.003852

Pollutant	Emissions Per Year (TONs)
CO_2	473.297349
CO_2e	474.855894

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		32
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		9482
Number of Annual Trim Test(s) per Aircraft:		9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32.4 Auxiliary Power Unit (APU)

32.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

32.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

32.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

32.5 Aircraft Engine Test Cell

32.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 32

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	3
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

32.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

32.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

32.6 Aerospace Ground Equipment (AGE)

32.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 9482

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

32.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

32.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7A CPs

- Activity Description:
In 2036, add 39,683 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	9.704106
SO_x	5.427985
NO_x	87.778523
CO	15.582231

Pollutant	Emissions Per Year (TONs)
PM 10	0.617065
PM 2.5	0.528363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.683317
N_2O	0.133315

Pollutant	Emissions Per Year (TONs)
CO_2	16250.676058
CO_2e	16305.137514

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	9.704106
SO_x	5.427985
NO_x	87.778523
CO	15.582231

Pollutant	Emissions Per Year (TONs)
PM 10	0.617065
PM 2.5	0.528363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.683317
N_2O	0.133315

Pollutant	Emissions Per Year (TONs)
CO_2	16250.676058
CO_2e	16305.137514

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		32
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		39683
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38Cs and LTOs

- Activity Description:
By 2036, remove 56 T-38Cs and 11,852 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-44.688505
SO_x	-4.447580
NO_x	-17.900539
CO	-489.799099

Pollutant	Emissions Per Year (TONs)
PM 10	-13.317476
PM 2.5	-12.086327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.534997
N_2O	-0.104509

Pollutant	Emissions Per Year (TONs)
CO_2	-12744.016195
CO_2e	-12786.691121

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-42.486796
SO_x	-3.891356
NO_x	-6.394328
CO	-479.568390

Pollutant	Emissions Per Year (TONs)
PM 10	-11.633996
PM 2.5	-10.465338
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.489874
N_2O	-0.095575

Pollutant	Emissions Per Year (TONs)
CO_2	-11650.209771
CO_2e	-11689.253525

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.789824
SO_x	-0.167746
NO_x	-0.706216
CO	-7.900955

Pollutant	Emissions Per Year (TONs)
PM 10	-0.103898
PM 2.5	-0.093755
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.021117
N_2O	-0.004120

Pollutant	Emissions Per Year (TONs)
CO_2	-502.209696
CO_2e	-503.892769

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.411886
SO_x	-0.388479
NO_x	-10.799995
CO	-2.329753

Pollutant	Emissions Per Year (TONs)
PM 10	-1.579582
PM 2.5	-1.527233
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.024006
N_2O	-0.004815

Pollutant	Emissions Per Year (TONs)
CO_2	-591.596728
CO_2e	-593.544828

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 11852
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34.4 Auxiliary Power Unit (APU)

34.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

34.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

34.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

34.5 Aircraft Engine Test Cell

34.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 112

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

34.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

34.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

34.6 Aerospace Ground Equipment (AGE)

34.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 11852

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

34.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

34.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38C CPs

- Activity Description:
By 2036, remove 49,603 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-10.399492
SO_x	-2.684553
NO_x	-2.644331
CO	-191.041262

Pollutant	Emissions Per Year (TONs)
PM 10	-4.649713
PM 2.5	-4.172149
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.337953
N_2O	-0.065935

Pollutant	Emissions Per Year (TONs)
CO_2	-8037.200335
CO_2e	-8064.135685

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-10.399492
SO_x	-2.684553
NO_x	-2.644331
CO	-191.041262

Pollutant	Emissions Per Year (TONs)
PM 10	-4.649713
PM 2.5	-4.172149
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.337953
N_2O	-0.065935

Pollutant	Emissions Per Year (TONs)
CO_2	-8037.200335
CO_2e	-8064.135685

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 49603
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A LTOs

- Activity Description:
In 2037, add 1,544 T-7A LTOs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	10.894454
SO_x	0.580876
NO_x	5.810638
CO	22.774140

Pollutant	Emissions Per Year (TONs)
PM 10	0.154052
PM 2.5	0.136698
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.069467
N_2O	0.013177

Pollutant	Emissions Per Year (TONs)
CO_2	1749.074622
CO_2e	1754.511474

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	10.894454
SO_x	0.580876
NO_x	5.810638
CO	22.774140

Pollutant	Emissions Per Year (TONs)
PM 10	0.154052
PM 2.5	0.136698
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.069467
N_2O	0.013177

Pollutant	Emissions Per Year (TONs)
CO_2	1749.074622
CO_2e	1754.511474

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1544
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 17.16
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36.4 Auxiliary Power Unit (APU)

36.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

36.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

36.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A CPs

- Activity Description:
In 2037, add 6,460 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.579733
SO_x	0.883622
NO_x	14.289476
CO	2.536633

Pollutant	Emissions Per Year (TONs)
PM 10	0.100452
PM 2.5	0.086012
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.111237
N_2O	0.021702

Pollutant	Emissions Per Year (TONs)
CO_2	2645.449370
CO_2e	2654.315156

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.579733
SO_x	0.883622
NO_x	14.289476
CO	2.536633

Pollutant	Emissions Per Year (TONs)
PM 10	0.100452
PM 2.5	0.086012
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.111237
N_2O	0.021702

Pollutant	Emissions Per Year (TONs)
CO_2	2645.449370
CO_2e	2654.315156

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6460
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38Cs and LTOs

- Activity Description:
By 2037, remove 47 T-38Cs and 3,142 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-12.684719
SO_x	-1.373722
NO_x	-5.246094
CO	-141.434019

Pollutant	Emissions Per Year (TONs)
PM 10	-3.761470
PM 2.5	-3.411681
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.166334
N_2O	-0.032487

Pollutant	Emissions Per Year (TONs)
CO_2	-3961.247924
CO_2e	-3974.514235

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-11.647537
SO_x	-1.129948
NO_x	-1.790267
CO	-134.185236

Pollutant	Emissions Per Year (TONs)
PM 10	-3.255518
PM 2.5	-2.928119
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.142247
N_2O	-0.027752

Pollutant	Emissions Per Year (TONs)
CO_2	-3382.916471
CO_2e	-3394.253757

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.662888
SO_x	-0.140787
NO_x	-0.592717
CO	-6.631159

Pollutant	Emissions Per Year (TONs)
PM 10	-0.087200
PM 2.5	-0.078688
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.017723
N_2O	-0.003458

Pollutant	Emissions Per Year (TONs)
CO_2	-421.497423
CO_2e	-422.910002

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.374295
SO_x	-0.102987
NO_x	-2.863110
CO	-0.617624

Pollutant	Emissions Per Year (TONs)
PM 10	-0.418752
PM 2.5	-0.404874
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006364
N_2O	-0.001276

Pollutant	Emissions Per Year (TONs)
CO_2	-156.834030
CO_2e	-157.350477

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 3142
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38.4 Auxiliary Power Unit (APU)

38.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

38.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

38.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

38.5 Aircraft Engine Test Cell

38.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 94

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	2
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

38.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

38.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

38.6 Aerospace Ground Equipment (AGE)

38.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 3142

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

38.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

38.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38C CPs

- Activity Description:
By 2037, remove 13,151 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-2.757166
SO_x	-0.711742
NO_x	-0.701079
CO	-50.649832

Pollutant	Emissions Per Year (TONs)
PM 10	-1.232756
PM 2.5	-1.106142
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.089600
N_2O	-0.017481

Pollutant	Emissions Per Year (TONs)
CO_2	-2130.863488
CO_2e	-2138.004725

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.757166
SO_x	-0.711742
NO_x	-0.701079
CO	-50.649832

Pollutant	Emissions Per Year (TONs)
PM 10	-1.232756
PM 2.5	-1.106142
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.089600
N_2O	-0.017481

Pollutant	Emissions Per Year (TONs)
CO_2	-2130.863488
CO_2e	-2138.004725

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 13151
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

Sheppard AFB ROI: Alternative 1 GHG Report

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

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Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2031	2,707	0.10583419	0.03961577	2,720	68,039	No
2032	1,302	0.04990581	0.02445684	1,310	68,039	No
2033	391	0.01044379	0.00695799	393	68,039	No
2034	5,327	0.21147647	0.04562072	5,345	68,039	No
2035	16,373	0.65170824	0.12925158	16,425	68,039	No
2036	24,014	0.9504671	0.18541787	24,090	68,039	No
2037	22,304	0.8759267	0.16892202	22,373	68,039	No
2038 [SS Year]	22,304	0.8759267	0.16892202	22,373	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	700,652,689	3,554,625	135,896	836,194,567
2032	700,652,689	3,554,625	135,896	836,194,567
2033	700,652,689	3,554,625	135,896	836,194,567
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2032	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2033	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2031-2038	State Total	5,605,221,516	28,436,999	1,087,166	6,689,556,535
2031-2038	U.S. Total	41,091,633,432	205,015,293	12,005,661	50,013,561,837
2031-2038	Action	94,721	3.731689	0.769165	95,030
Percent of State Totals		0.00168988%	0.00001312%	0.00007075%	0.00142057%
Percent of U.S. Totals		0.00023051%	0.00000182%	0.00000641%	0.00019001%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00002546%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Sheppard AFB ROI: Alternative 2 ACAM Report

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
_X_ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2031

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.904	250	No
NOx	10.892	250	No
CO	17.239	250	No
SOx	0.028	250	No
PM 10	16.479	250	No
PM 2.5	0.316	250	No
Pb	0.000	25	No
NH3	0.031	250	No

2032

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.734	250	No
NOx	4.898	250	No
CO	7.971	250	No
SOx	0.014	250	No
PM 10	0.152	250	No
PM 2.5	0.130	250	No
Pb	0.000	25	No
NH3	0.019	250	No

2033

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.163	250	No
NOx	0.255	250	No
CO	1.851	250	No
SOx	0.003	250	No
PM 10	0.027	250	No
PM 2.5	0.019	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	48.378	250	No
NOx	59.082	250	No
CO	332.266	250	Yes
SOx	6.241	250	No
PM 10	7.646	250	No
PM 2.5	6.883	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	89.594	250	No
NOx	227.567	250	No
CO	-213.876	250	No
SOx	11.342	250	No
PM 10	-8.858	250	No
PM 2.5	-8.021	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	120.581	250	No
NOx	378.092	250	Yes
CO	-823.133	250	No
SOx	14.891	250	No
PM 10	-26.775	250	No
PM 2.5	-24.203	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	116.994	250	No
NOx	395.743	250	Yes
CO	-1029.097	250	No
SOx	14.173	250	No
PM 10	-32.628	250	No
PM 2.5	-29.502	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	116.994	250	No
NOx	395.743	250	Yes
CO	-1029.097	250	No
SOx	14.173	250	No
PM 10	-32.628	250	No
PM 2.5	-29.502	250	No
Pb	0.000	25	No
NH3	0.000	250	No

The steady state estimated annual net emissions associated with this action exceed the insignificance indicators, indicating a potential for a significant impact to air quality. Therefore, the ACAM analysis is inconclusive and further air quality impact assessment is needed.

Carolyn Hein, Contractor — May 12 2025

Name, Title — **Date**

Sheppard AFB ROI: Alternative 2 ACAM Detail Report

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2031

- Action Purpose and Need:
The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:
The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating

those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Ground-Based Training System (GBTS) Facility
3.	Heating	GBTS Facility (Heating)
4.	Construction / Demolition	Maintenance Hangar/Unit Maintenance Training (UMT) Facility
5.	Heating	UMT Facility (Heating)
6.	Construction / Demolition	Ramp Expansion
7.	Construction / Demolition	Hush House Pad
8.	Construction / Demolition	T-7A Shelters
9.	Construction / Demolition	Addition to Egress Shop
10.	Heating	Addition to Egress Shop (Heating)
11.	Construction / Demolition	Construct Jet Blast Deflectors
12.	Construction / Demolition	Airfield Improvements
13.	Paint Booth	Airfield Improvements (Painting)
14.	Construction / Demolition	Renovate Squad Operations 1
15.	Construction / Demolition	Renovate Squad Operations 2
16.	Construction / Demolition	Hangar Renovation
17.	Construction / Demolition	Remove Aboveground Service Modules of the CASS
18.	Construction / Demolition	Compass Rose & Trim Pad
19.	Paint Booth	Compass Rose & Trim Pad (Painting)
20.	Construction / Demolition	Munitions Storage for T-7A
21.	Construction / Demolition	Hammerhead Expansion
22.	Construction / Demolition	Support Mechanized Material Handling System (in T-7A parts Warehouse)
23.	Personnel	Transitional Increase of 100 Personnel
24.	Aircraft	2034 Add T-7As and LTOs/
25.	Aircraft	2034 Add T-7A CPs
26.	Aircraft	2034 Add T-38C LTOs
27.	Aircraft	2034 Add T-38C CPs
28.	Aircraft	2035 Add T-7As and LTOs
29.	Aircraft	2035 Add T-7A CPs
30.	Aircraft	2035 Remove T-38Cs and LTOs
31.	Aircraft	2035 Remove T-38C CPs
32.	Aircraft	2036 Add T-7As and LTOs
33.	Aircraft	2036 Add T-7A CPs
34.	Aircraft	2036 Remove T-38Cs and LTOs
35.	Aircraft	2036 Remove T-38C CPs
36.	Aircraft	2037 Add T-7A LTOs
37.	Aircraft	2037 Add T-7A CPs
38.	Aircraft	2037 Remove T-38Cs and LTOs
39.	Aircraft	2037 Remove T-38C CPs

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ground-Based Training System (GBTS) Facility

- Activity Description:
Construction of the GBTS facility would occur over a 2-year period from January 2031 through December 2032. Construction would include renovation of an existing facility (estimated at 30,000 SF) and construction of a 16,000 SF addition. Associated parking would be constructed along Avenue J (approx. 100,000 SF).

Site grading would occur on the site for new construction and pavements (approx. 116,000 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

It was assumed 25 percent of the total square footage of the renovations (approx. 30,000 SF) would be construction to equate the renovations (30,000 SF * 0.25 = 7,500 SF). New construction would include a 16,000 SF addition. Total construction for the GBTS facility was estimated at 37,500 SF. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,000 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 100,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.767447
SO_x	0.004973
NO_x	1.847399
CO	2.857429

Pollutant	Total Emissions (TONs)
PM 10	2.393357
PM 2.5	0.048628
Pb	0.000000
NH_3	0.005399

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.019673
N_2O	0.007686

Pollutant	Total Emissions (TONs)
CO_2	504.564739
CO_2e	507.152392

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 116000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)

WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 37500

Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1

Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 100000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459

LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: GBTS Facility (Heating)

- Activity Description:
Heating/cooling for the GBTS facility addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
GBTS Facility Addition – 16,000 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.002397
SO_x	0.000261
NO_x	0.043581
CO	0.036608

Pollutant	Emissions Per Year (TONs)
PM 10	0.003312
PM 2.5	0.003312
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000985
N_2O	0.000985

Pollutant	Emissions Per Year (TONs)
CO_2	52.305423
CO_2e	52.594008

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 16000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0572

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

3.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Maintenance Hangar/Unit Maintenance Training (UMT) Facility

- Activity Description:

Construction of the UMT facility (46,500 SF) would occur over a 2-year period from January 2031 through December 2032. An approximately 15,000 SF parking area would also be constructed.

Site grading would occur on the site for new construction and pavements (approx. 61,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

Construction would include the 46,500-SF UMT facility. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,500 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 15,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.759672
SO_x	0.004743
NO_x	1.757835
CO	2.698828

Pollutant	Total Emissions (TONs)
PM 10	1.305911
PM 2.5	0.045534
Pb	0.000000
NH_3	0.005541

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.018675
N_2O	0.008118

Pollutant	Total Emissions (TONs)
CO_2	482.352228
CO_2e	485.026336

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration

Number of Month: 2
Number of Days: 0

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 61500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**

Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 46500
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887

MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46500
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

4.5 Paving Phase

4.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

5. Heating

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: UMT Facility (Heating)

- Activity Description:
Heating/cooling for the UMT facility would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
UMT Facility – 46,500 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007892
SO_x	0.000861
NO_x	0.143486
CO	0.120528

Pollutant	Emissions Per Year (TONs)
PM 10	0.010905
PM 2.5	0.010905
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003243
N_2O	0.003243

Pollutant	Emissions Per Year (TONs)
CO_2	172.210119
CO_2e	173.160253

5.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 46500
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0648

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

5.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

5.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ramp Expansion

- Activity Description:

Ramp expansion would include grading and paving new ramp areas. Activities would occur over a 2-year period starting in January 2031.

Site grading would occur on the entire area (approx. 60,000 SF). Site grading would begin in January 2031 and last approximately 12 months.

Paving would occur on approximately 60,000 SF. Paving would begin January 2032 and last approximately 12 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.223808
SO_x	0.004137
NO_x	1.747959
CO	2.696316

Pollutant	Total Emissions (TONs)
PM 10	7.235707
PM 2.5	0.066310
Pb	0.000000
NH_3	0.003490

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.017588
N_2O	0.003891

Pollutant	Total Emissions (TONs)
CO_2	439.110329
CO_2e	440.634041

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 60000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)

20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

6.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 60000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hush House Pad

- Activity Description:
Construction of the hush house pad (27,500 SF) would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the entire site (27,500 SF). Site grading would begin in January 2031 and last approximately 4 months.

Trenching for the reinforced concrete and utilities would occur over the entire site (27,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in May 2031 and last approximately 4 months.

Construction of the new hush house pad would total approximately 27,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in September 2031 and last approximately 16 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 0
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.191392
SO_x	0.003579
NO_x	1.526256
CO	2.354629

Pollutant	Total Emissions (TONs)
PM 10	2.239433
PM 2.5	0.045659
Pb	0.000000
NH_3	0.003939

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.014222
N_2O	0.003307

Pollutant	Total Emissions (TONs)
CO_2	356.767753
CO_2e	358.042202

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.2 Trenching/Excavating Phase

7.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4
Number of Days: 0

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0

Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690

HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.3 Building Construction Phase

7.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

7.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 27500
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Concrete/Industrial Saws Composite	1	8
Generator Sets Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	0
Plate Compactors Composite	1	8
Rollers Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559

Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: T-7A Shelters

- Activity Description:
Construction of 108 aircraft shelters (sunshades) would occur over a 2-year period from January 2031 through December 2032.

Demolition would be required for the existing T-38C shelters. Demolition would include removal of 131 sunshades totaling approximately 295,000 SF. Demolition would begin in January 2031 and last approximately 12 months.

Construction would include installation of 108 T-7A sunshades totaling approximately 245,000 SF. The height of all sunshades were assumed to be 15 feet. Construction would begin in January 2032 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.197240
SO_x	0.004852
NO_x	1.692855
CO	2.765679

Pollutant	Total Emissions (TONs)
PM 10	0.983944
PM 2.5	0.041995
Pb	0.000000
NH_3	0.011037

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.020087
N_2O	0.022457

Pollutant	Total Emissions (TONs)
CO_2	573.047860
CO_2e	579.561591

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 295000
Height of Building to be demolished (ft): 15

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546

HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1\ yd^3 / 27\ ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Building Construction Phase

8.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

8.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 245000
Height of Building (ft): 15
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	2	7
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16757	0.00487	1.25709	1.55759	0.05276	0.04854
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19055	0.00487	1.77383	3.55935	0.05272	0.04850
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53211	0.00793	4.25580	2.83928	0.16416	0.15103
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.34949	0.00735	3.21107	4.36083	0.03339	0.03072

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30495	570.25522
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30587	570.25615

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop

- Activity Description:
Construction of the addition to the egress shop would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the site of the addition, 3,400 SF. Site grading would begin in January 2031 and last approximately 1 month.

Construction of the egress shop addition would total approximately 3,400 SF. The height of the addition was assumed to be 20 feet. Construction would begin in February 2031 and last approximately 22 months.

Architectural coatings would be applied to the addition, totaling 3,400 SF. Architectural coating application would begin in December 2032 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.143878
SO_x	0.002583
NO_x	0.805008
CO	1.473874

Pollutant	Total Emissions (TONs)
PM 10	0.063196
PM 2.5	0.026319
Pb	0.000000
NH_3	0.002309

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011335
N_2O	0.002639

Pollutant	Total Emissions (TONs)
CO_2	283.411958
CO_2e	284.428557

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613

HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.2 Building Construction Phase

9.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 22
Number of Days: 0

9.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3400
Height of Building (ft): 20
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

9.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.3 Architectural Coatings Phase

9.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 1
Number of Days: 0

9.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 3400
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539

LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

10. Heating

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop (Heating)

- Activity Description:
Heating/cooling for the new addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
Addition to the Egress Shop – 3,400 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000845
SO_x	0.000092
NO_x	0.015365
CO	0.012906

Pollutant	Emissions Per Year (TONs)
PM 10	0.001168
PM 2.5	0.001168
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000347
N_2O	0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	18.440634
CO_2e	18.542376

10.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 3400
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0949

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

10.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

10.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Jet Blast Deflectors

- Activity Description:
Construction of the jet blast deflectors would occur over a 2-year period from January 2031 through December 2032.

Construction of the deflectors would total approximately 2,000 SF. The height of the deflectors was assumed to be 12 feet. Construction would begin in January 2031 and last approximately 24 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.101013
SO_x	0.002586
NO_x	0.774680
CO	1.461830

Pollutant	Total Emissions (TONs)
PM 10	0.027217
PM 2.5	0.024360
Pb	0.000000
NH_3	0.002352

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011342
N_2O	0.002520

Pollutant	Total Emissions (TONs)
CO_2	283.219970
CO_2e	284.205261

11.1 Building Construction Phase

11.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 24
Number of Days: 0

11.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

11.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

11.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements

- Activity Description:

Airfield improvements would include airfield markings, installation of mooring and anchor rods, replacing the aircraft arresting system, and removing aboveground service modules of the Centralized Aircraft Support System (CASS). Activities would occur over a 1-year period starting in January 2031 (painting activities would occur from September through December 2031 and are captured in a separate Paint Booth activity).

Trenching/excavation for the mooring and anchor rods was estimated to occur on 100 SF. Excavation for replacing the arresting system may be required (approx. 1,000 SF). Total excavation was estimated at 1,100 SF. Excavation would begin in January 2031 and last approximately 2 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

The construction activity was used to characterize removal of existing airfield markings. Grinders would likely be used to remove existing paint, estimated at 50,000 SF. Paint removal would begin in March 2031 and last approximately 5 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 7
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.033345
SO_x	0.000641
NO_x	0.279630
CO	0.393083

Pollutant	Total Emissions (TONs)
PM 10	0.027621
PM 2.5	0.005028
Pb	0.000000
NH_3	0.000738

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.002210
N_2O	0.000640

Pollutant	Total Emissions (TONs)
CO_2	56.045595
CO_2e	56.277179

12.1 Trenching/Excavating Phase

12.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration

Number of Month: 2
Number of Days: 0

12.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1100
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

12.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

12.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12.2 Building Construction Phase

12.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 5
Number of Days: 0

12.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 50000
Height of Building (ft): 1
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

12.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702

MC	0.10118	0.00284	394.03643	397.62186

12.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

13. Paint Booth

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements (Painting)

- Activity Description:
Painting activities would be a continuation of the airfield improvements construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in August 2031 and last approximately 5 months.

- Activity Start Date
Start Month: 8
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.011873
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

13.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

13.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 1

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 165,000 SF) would be construction to equate the renovations (165,000 SF * 0.25 = 41,250 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (165,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.036021
SO_x	0.002744
NO_x	0.982507
CO	1.500633

Pollutant	Total Emissions (TONs)
PM 10	0.027778
PM 2.5	0.023494
Pb	0.000000
NH_3	0.003633

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010656
N_2O	0.005897

Pollutant	Total Emissions (TONs)
CO_2	280.268179
CO_2e	282.129405

14.1 Building Construction Phase

14.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

14.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 41250
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

14.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

14.2 Architectural Coatings Phase

14.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

14.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 165000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

14.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 2

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 100,000 SF) would be construction to equate the renovations (100,000 SF * 0.25 = 25,000 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (100,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.281448
SO_x	0.002710
NO_x	0.968997
CO	1.488778

Pollutant	Total Emissions (TONs)
PM 10	0.026657
PM 2.5	0.023040
Pb	0.000000
NH_3	0.003041

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010474
N_2O	0.004443

Pollutant	Total Emissions (TONs)
CO_2	270.068383
CO_2e	271.539060

15.1 Building Construction Phase

15.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

15.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 25000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

15.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

15.2 Architectural Coatings Phase

15.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

15.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 100000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

15.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hangar Renovation

- Activity Description:
Modification of either Building 2404, 2406, 2408, or 2410 would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the hangar (approx. 40,000 SF) would be construction to equate the renovations (40,000 SF * 0.25 = 10,000 SF). The height of the hangar was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (40,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.575177
SO_x	0.002406
NO_x	0.881174
CO	1.389029

Pollutant	Total Emissions (TONs)
PM 10	0.022338
PM 2.5	0.019599
Pb	0.000000
NH_3	0.002494

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.009110
N_2O	0.002861

Pollutant	Total Emissions (TONs)
CO_2	231.143070
CO_2e	232.156290

16.1 Building Construction Phase

16.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

16.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 10000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

16.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

16.2 Architectural Coatings Phase

16.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

16.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 40000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

16.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

17. Construction / Demolition

17.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Remove Aboveground Service Modules of the CASS

- Activity Description:
Removal of T-38C CASS modules would occur over a 1-year period starting in January 2031.

It was assumed approximately 1,000 SF would be excavated and filled for CASS removal. Excavation would begin in January 2031 and last approximately 12 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.047432
SO_x	0.000912
NO_x	0.417206
CO	0.720250

Pollutant	Total Emissions (TONs)
PM 10	0.127785
PM 2.5	0.007411
Pb	0.000000
NH_3	0.001162

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.003996
N_2O	0.000890

Pollutant	Total Emissions (TONs)
CO_2	100.176741
CO_2e	100.524406

17.1 Trenching/Excavating Phase

17.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

17.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

17.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

17.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18. Construction / Demolition

18.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad

- Activity Description:
Repairs and preparation of existing aircraft pavement for a compass rose and trim pad would occur over aa 1-year period starting in January 2031 (compass rose painting activities would occur from November through December 2031 and are captured in a separate Paint Booth activity).

Site grading would occur on the site for the compass rose/trim pad and access road (approx. 30,000 SF). Site grading would begin in January 2031 and last approximately 3 months.

Excavation would occur over the entire site (30,000 SF). It was assumed excavated fill would be reused in place. Trenching would begin in April 2031 and last approximately 3 months.

Construction of the compass rose and trim pad would total approximately 15,000 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in July 2031 and last approximately 3 months.

Paving for the access road would occur on approximately 15,000 SF. Paving would begin in October 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.068650
SO_x	0.001254
NO_x	0.553532
CO	0.812319

Pollutant	Total Emissions (TONs)
PM 10	1.809833
PM 2.5	0.017326
Pb	0.000000
NH_3	0.001088

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005099
N_2O	0.001213

Pollutant	Total Emissions (TONs)
CO_2	127.632549
CO_2e	128.096865

18.1 Site Grading Phase

18.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374

LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.2 Trenching/Excavating Phase

18.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.3 Building Construction Phase

18.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1

Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 15000
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

18.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.4 Paving Phase

18.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

18.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

19. Paint Booth

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad (Painting)

- Activity Description:
Painting activities would be a continuation of the compass rose & trim pad construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in November 2031 and last approximately 2 months.

- Activity Start Date
Start Month: 11
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.004749
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

19.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

19.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

20. Construction / Demolition

20.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Munitions Storage for T-7A

- Activity Description:
Construction of the concrete pad for munitions storage would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,600 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for the concrete pad would occur over the entire site (3,600 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the pad would total approximately 3,600 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582613
CO	0.932667

Pollutant	Total Emissions (TONs)
PM 10	0.165142
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001377

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001309

Pollutant	Total Emissions (TONs)
CO_2	144.008411
CO_2e	144.516483

20.1 Site Grading Phase

20.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.2 Trenching/Excavating Phase

20.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.3 Building Construction Phase

20.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

20.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3600
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

20.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21. Construction / Demolition

21.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hammerhead Expansion

- Activity Description:
Construction for the hammerhead expansion would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Excavation would occur over the entire site (3,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the hammerhead expansion would total approximately 3,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12

End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582599
CO	0.932655

Pollutant	Total Emissions (TONs)
PM 10	0.161162
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001376

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001308

Pollutant	Total Emissions (TONs)
CO_2	143.997949
CO_2e	144.505622

21.1 Site Grading Phase

21.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.2 Trenching/Excavating Phase

21.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318

Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.3 Building Construction Phase

21.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

21.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3500
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

21.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

22. Construction / Demolition

22.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Support Mechanized Material Handling System (in T-7A parts Warehouse)

- Activity Description:
Renovations for interior electrical support would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 10,000 SF) would be construction to equate the renovations (10,000 SF * 0.25 = 2,500 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.050581
SO_x	0.001297
NO_x	0.389086
CO	0.732447

Pollutant	Total Emissions (TONs)
PM 10	0.013753
PM 2.5	0.012239
Pb	0.000000
NH_3	0.001253

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005695
N_2O	0.001448

Pollutant	Total Emissions (TONs)
CO_2	142.928113
CO_2e	143.471229

22.1 Building Construction Phase

22.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

22.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2500

Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

22.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

22.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

23. Personnel

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Transitional Increase of 100 Personnel

- Activity Description:
Increase of 100 personnel during the T-7A and T-38C transition period (i.e., 2033 through 2036). Assumed all personnel commute daily.

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2036

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.607366
SO_x	0.005903
NO_x	0.211956
CO	6.723078

Pollutant	Total Emissions (TONs)
PM 10	0.045211
PM 2.5	0.016428
Pb	0.000000
NH_3	0.088579

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.027749
N_2O	0.012380

Pollutant	Total Emissions (TONs)
CO_2	753.334934
CO_2e	757.394193

23.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 100
Civilian Personnel: 0
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

23.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

23.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25418	0.00210	0.06585	2.90895	0.01876	0.00647	0.04233
LDGT	0.20052	0.00286	0.09270	2.68756	0.01996	0.00714	0.03585
HDGV	0.52890	0.00655	0.29513	6.07732	0.04127	0.01931	0.08206
LDDV	0.09228	0.00124	0.14059	7.44001	0.02278	0.00874	0.01684
LDDT	0.07431	0.00115	0.12481	2.41221	0.01970	0.00705	0.01527
HDDV	0.05762	0.00390	1.37962	1.33933	0.12436	0.04792	0.06921
MC	2.54108	0.00304	0.60490	11.11798	0.03078	0.02161	0.05640

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01002	0.00438	267.46963	268.91076
LDGT	0.01058	0.00613	364.36705	366.28905
HDGV	0.03206	0.02033	834.70184	840.98717
LDDV	0.04934	0.00067	368.02625	369.58553
LDDT	0.02373	0.00098	344.66551	345.59058
HDDV	0.02092	0.16975	1164.86428	1210.43459
MC	0.09969	0.00284	394.07263	397.61557

23.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7As and LTOs/

- Activity Description:
In 2034, add 28 T-7As and 3,308 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	25.762138
SO_x	2.006583
NO_x	24.966126
CO	84.586104

Pollutant	Emissions Per Year (TONs)
PM 10	1.566520
PM 2.5	1.432357
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.237817
N_2O	0.045628

Pollutant	Emissions Per Year (TONs)
CO_2	5869.387585
CO_2e	5888.137924

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	23.817663
SO_x	1.510774
NO_x	16.694210
CO	49.556157

Pollutant	Emissions Per Year (TONs)
PM 10	0.360225
PM 2.5	0.318690
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.182351
N_2O	0.034770

Pollutant	Emissions Per Year (TONs)
CO_2	4544.500170
CO_2e	4558.820007

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.550404
SO_x	0.387381
NO_x	5.257540
CO	34.379691

Pollutant	Emissions Per Year (TONs)
PM 10	0.765419
PM 2.5	0.687402
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.048767
N_2O	0.009514

Pollutant	Emissions Per Year (TONs)
CO_2	1159.767438
CO_2e	1163.654207

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.394070
SO_x	0.108428
NO_x	3.014376
CO	0.650255

Pollutant	Emissions Per Year (TONs)
PM 10	0.440876
PM 2.5	0.426265
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006700
N_2O	0.001344

Pollutant	Emissions Per Year (TONs)
CO_2	165.119978
CO_2e	165.663710

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 3308
Number of Annual Trim Test(s) per Aircraft: 11

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 17.16
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24.4 Auxiliary Power Unit (APU)

24.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

24.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

24.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

24.5 Aircraft Engine Test Cell

24.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 28

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 4
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

24.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

24.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

24.6 Aerospace Ground Equipment (AGE)

24.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 3308

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

24.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8

MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

24.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7A CPs

- Activity Description:
In 2034, add 13,843 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	3.385176
SO_x	1.893496
NO_x	30.620621
CO	5.435699

Pollutant	Emissions Per Year (TONs)
PM 10	0.215257
PM 2.5	0.184314
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.238368
N_2O	0.046506

Pollutant	Emissions Per Year (TONs)
CO_2	5668.878579
CO_2e	5687.876889

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	3.385176
SO_x	1.893496
NO_x	30.620621
CO	5.435699

Pollutant	Emissions Per Year (TONs)
PM 10	0.215257
PM 2.5	0.184314
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.238368
N_2O	0.046506

Pollutant	Emissions Per Year (TONs)
CO_2	5668.878579
CO_2e	5687.876889

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 13843
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-38C LTOs

- Activity Description:
In 2034, increase T-38C LTOs by 4,328.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	15.270601
SO_x	1.358467
NO_x	2.274530
CO	170.640361

Pollutant	Emissions Per Year (TONs)
PM 10	4.139440
PM 2.5	3.723864
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.171014
N_2O	0.033365

Pollutant	Emissions Per Year (TONs)
CO_2	4067.071394
CO_2e	4080.701512

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	15.270601
SO_x	1.358467
NO_x	2.274530
CO	170.640361

Pollutant	Emissions Per Year (TONs)
PM 10	4.139440
PM 2.5	3.723864
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.171014
N_2O	0.033365

Pollutant	Emissions Per Year (TONs)
CO_2	4067.071394
CO_2e	4080.701512

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 4328
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26.4 Auxiliary Power Unit (APU)

26.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

26.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

26.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-38C CPs

- Activity Description:
In 2034, increase T-38C LTOs by 18,111.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	3.797053
SO_x	0.980181
NO_x	0.965496
CO	69.752803

Pollutant	Emissions Per Year (TONs)
PM 10	1.697699
PM 2.5	1.523331
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.123393
N_2O	0.024074

Pollutant	Emissions Per Year (TONs)
CO_2	2934.534913
CO_2e	2944.369522

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	3.797053
SO_x	0.980181
NO_x	0.965496
CO	69.752803

Pollutant	Emissions Per Year (TONs)
PM 10	1.697699
PM 2.5	1.523331
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.123393
N_2O	0.024074

Pollutant	Emissions Per Year (TONs)
CO_2	2934.534913
CO_2e	2944.369522

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		18111
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7As and LTOs

- Activity Description:
In 2035, add 48 T-7As and 12,679 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	94.447927
SO_x	6.306136
NO_x	75.559373
CO	249.753086

Pollutant	Emissions Per Year (TONs)
PM 10	4.318713
PM 2.5	3.978995
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.737189
N_2O	0.140874

Pollutant	Emissions Per Year (TONs)
CO_2	18350.588045
CO_2e	18408.561017

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	90.279688
SO_x	5.226468
NO_x	54.992857
CO	188.324155

Pollutant	Emissions Per Year (TONs)
PM 10	1.316765
PM 2.5	1.166791
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.627909
N_2O	0.119413

Pollutant	Emissions Per Year (TONs)
CO_2	15729.538571
CO_2e	15778.764479

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	2.657836
SO_x	0.664081
NO_x	9.012926
CO	58.936613

Pollutant	Emissions Per Year (TONs)
PM 10	1.312147
PM 2.5	1.178404
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.083600
N_2O	0.016310

Pollutant	Emissions Per Year (TONs)
CO_2	1988.172751
CO_2e	1994.835783

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.510403
SO_x	0.415586
NO_x	11.553589
CO	2.492317

Pollutant	Emissions Per Year (TONs)
PM 10	1.689801
PM 2.5	1.633800
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.025681
N_2O	0.005151

Pollutant	Emissions Per Year (TONs)
CO_2	632.876723
CO_2e	634.960755

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		12679
Number of Annual Trim Test(s) per Aircraft:		11

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28.4 Auxiliary Power Unit (APU)

28.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

28.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

28.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

28.5 Aircraft Engine Test Cell

28.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 48

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	4
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

28.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

28.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

28.6 Aerospace Ground Equipment (AGE)

28.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 12679

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

28.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

28.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7A CPs

- Activity Description:
In 2035, add 53,066 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	12.976794
SO_x	7.258560
NO_x	117.381627
CO	20.837303

Pollutant	Emissions Per Year (TONs)
PM 10	0.825168
PM 2.5	0.706552
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.913765
N_2O	0.178276

Pollutant	Emissions Per Year (TONs)
CO_2	21731.178985
CO_2e	21804.007442

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	12.976794
SO_x	7.258560
NO_x	117.381627
CO	20.837303

Pollutant	Emissions Per Year (TONs)
PM 10	0.825168
PM 2.5	0.706552
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.913765
N_2O	0.178276

Pollutant	Emissions Per Year (TONs)
CO_2	21731.178985
CO_2e	21804.007442

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		53066
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38Cs and LTOs

- Activity Description:
By 2035, remove 28 T-38Cs and 14,471 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-53.511745
SO_x	-5.185967
NO_x	-21.227525
CO	-583.483562

Pollutant	Emissions Per Year (TONs)
PM 10	-15.970294
PM 2.5	-14.496483
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.622449
N_2O	-0.121600

Pollutant	Emissions Per Year (TONs)
CO_2	-14828.369574
CO_2e	-14878.022234

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-51.392956
SO_x	-4.627771
NO_x	-7.687889
CO	-576.688513

Pollutant	Emissions Per Year (TONs)
PM 10	-13.989714
PM 2.5	-12.584891
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.582580
N_2O	-0.113662

Pollutant	Emissions Per Year (TONs)
CO_2	-13854.939697
CO_2e	-13901.372238

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.394912
SO_x	-0.083873
NO_x	-0.353108
CO	-3.950478

Pollutant	Emissions Per Year (TONs)
PM 10	-0.051949
PM 2.5	-0.046878
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010559
N_2O	-0.002060

Pollutant	Emissions Per Year (TONs)
CO_2	-251.104848
CO_2e	-251.946384

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.723877
SO_x	-0.474323
NO_x	-13.186528
CO	-2.844572

Pollutant	Emissions Per Year (TONs)
PM 10	-1.928631
PM 2.5	-1.864714
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.029310
N_2O	-0.005879

Pollutant	Emissions Per Year (TONs)
CO_2	-722.325030
CO_2e	-724.703611

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 14471
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30.4 Auxiliary Power Unit (APU)

30.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

30.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

30.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

30.5 Aircraft Engine Test Cell

30.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 56

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

30.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

30.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

30.6 Aerospace Ground Equipment (AGE)

30.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 14471

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

30.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

30.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38C CPs

- Activity Description:
By 2035, remove 60,562 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-12.697095
SO_x	-3.277663
NO_x	-3.228555
CO	-233.248814

Pollutant	Emissions Per Year (TONs)
PM 10	-5.676994
PM 2.5	-5.093920
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.412618
N_2O	-0.080502

Pollutant	Emissions Per Year (TONs)
CO_2	-9812.892904
CO_2e	-9845.779193

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-12.697095
SO_x	-3.277663
NO_x	-3.228555
CO	-233.248814

Pollutant	Emissions Per Year (TONs)
PM 10	-5.676994
PM 2.5	-5.093920
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.412618
N_2O	-0.080502

Pollutant	Emissions Per Year (TONs)
CO_2	-9812.892904
CO_2e	-9845.779193

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		60562
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7As and LTOs

- Activity Description:
In 2036, add 32 T-7As and 11,852 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	87.355908
SO_x	5.594393
NO_x	66.263455
CO	217.310741

Pollutant	Emissions Per Year (TONs)
PM 10	3.671358
PM 2.5	3.391656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.651286
N_2O	0.124307

Pollutant	Emissions Per Year (TONs)
CO_2	16254.238256
CO_2e	16305.415645

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	84.172132
SO_x	4.763193
NO_x	49.454843
CO	175.689912

Pollutant	Emissions Per Year (TONs)
PM 10	1.217011
PM 2.5	1.078821
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.571547
N_2O	0.108619

Pollutant	Emissions Per Year (TONs)
CO_2	14337.193027
CO_2e	14381.980295

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.771891
SO_x	0.442721
NO_x	6.008618
CO	39.291075

Pollutant	Emissions Per Year (TONs)
PM 10	0.874765
PM 2.5	0.785602
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055733
N_2O	0.010874

Pollutant	Emissions Per Year (TONs)
CO_2	1325.448501
CO_2e	1329.890522

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.411886
SO_x	0.388479
NO_x	10.799995
CO	2.329753

Pollutant	Emissions Per Year (TONs)
PM 10	1.579582
PM 2.5	1.527233
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.024006
N_2O	0.004815

Pollutant	Emissions Per Year (TONs)
CO_2	591.596728
CO_2e	593.544828

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		32
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		11852
Number of Annual Trim Test(s) per Aircraft:		11

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32.4 Auxiliary Power Unit (APU)

32.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

32.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

32.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

32.5 Aircraft Engine Test Cell

32.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 32

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	4
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

32.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

32.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

32.6 Aerospace Ground Equipment (AGE)

32.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 11852

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

32.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

32.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7A CPs

- Activity Description:
In 2036, add 49,605 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	12.130438
SO_x	6.785152
NO_x	109.725919
CO	19.478280

Pollutant	Emissions Per Year (TONs)
PM 10	0.771350
PM 2.5	0.660470
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.854168
N_2O	0.166648

Pollutant	Emissions Per Year (TONs)
CO_2	20313.856962
CO_2e	20381.935498

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	12.130438
SO_x	6.785152
NO_x	109.725919
CO	19.478280

Pollutant	Emissions Per Year (TONs)
PM 10	0.771350
PM 2.5	0.660470
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.854168
N_2O	0.166648

Pollutant	Emissions Per Year (TONs)
CO_2	20313.856962
CO_2e	20381.935498

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		32
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		49605
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38Cs and LTOs

- Activity Description:
By 2036, remove 56 T-38Cs and 14,816 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-55.499558
SO_x	-5.475069
NO_x	-22.159145
CO	-607.243571

Pollutant	Emissions Per Year (TONs)
PM 10	-16.547371
PM 2.5	-15.018526
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.658119
N_2O	-0.128563

Pollutant	Emissions Per Year (TONs)
CO_2	-15677.270194
CO_2e	-15729.766798

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-52.944758
SO_x	-4.821692
NO_x	-7.952023
CO	-596.430227

Pollutant	Emissions Per Year (TONs)
PM 10	-14.468862
PM 2.5	-13.015600
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.606992
N_2O	-0.118424

Pollutant	Emissions Per Year (TONs)
CO_2	-14435.514673
CO_2e	-14483.892915

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.789824
SO_x	-0.167746
NO_x	-0.706216
CO	-7.900955

Pollutant	Emissions Per Year (TONs)
PM 10	-0.103898
PM 2.5	-0.093755
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.021117
N_2O	-0.004120

Pollutant	Emissions Per Year (TONs)
CO_2	-502.209696
CO_2e	-503.892769

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.764976
SO_x	-0.485631
NO_x	-13.500905
CO	-2.912388

Pollutant	Emissions Per Year (TONs)
PM 10	-1.974611
PM 2.5	-1.909171
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.030009
N_2O	-0.006019

Pollutant	Emissions Per Year (TONs)
CO_2	-739.545826
CO_2e	-741.981114

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 14816
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34.4 Auxiliary Power Unit (APU)

34.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

34.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

34.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

34.5 Aircraft Engine Test Cell

34.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 112

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

34.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

34.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

34.6 Aerospace Ground Equipment (AGE)

34.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 14816

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

34.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

34.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38C CPs

- Activity Description:
By 2036, remove 62,004 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-12.999417
SO_x	-3.355705
NO_x	-3.305427
CO	-238.802541

Pollutant	Emissions Per Year (TONs)
PM 10	-5.812165
PM 2.5	-5.215208
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.422442
N_2O	-0.082419

Pollutant	Emissions Per Year (TONs)
CO_2	-10046.540927
CO_2e	-10080.210249

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-12.999417
SO_x	-3.355705
NO_x	-3.305427
CO	-238.802541

Pollutant	Emissions Per Year (TONs)
PM 10	-5.812165
PM 2.5	-5.215208
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.422442
N_2O	-0.082419

Pollutant	Emissions Per Year (TONs)
CO_2	-10046.540927
CO_2e	-10080.210249

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		62004
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A LTOs

- Activity Description:
In 2037, add 1,929 T-7A LTOs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	13.588042
SO_x	0.714892
NO_x	7.093590
CO	28.434003

Pollutant	Emissions Per Year (TONs)
PM 10	0.191150
PM 2.5	0.169671
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085426
N_2O	0.016196

Pollutant	Emissions Per Year (TONs)
CO_2	2152.796227
CO_2e	2159.480140

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	13.588042
SO_x	0.714892
NO_x	7.093590
CO	28.434003

Pollutant	Emissions Per Year (TONs)
PM 10	0.191150
PM 2.5	0.169671
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085426
N_2O	0.016196

Pollutant	Emissions Per Year (TONs)
CO_2	2152.796227
CO_2e	2159.480140

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1929
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 17.16
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.9

Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36.4 Auxiliary Power Unit (APU)

36.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

36.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

36.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A CPs

- Activity Description:
In 2037, add 8,075 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.974666
SO_x	1.104528
NO_x	17.861844
CO	3.170791

Pollutant	Emissions Per Year (TONs)
PM 10	0.125565
PM 2.5	0.107515
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.139047
N_2O	0.027128

Pollutant	Emissions Per Year (TONs)
CO_2	3306.811712
CO_2e	3317.893945

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.974666
SO_x	1.104528
NO_x	17.861844
CO	3.170791

Pollutant	Emissions Per Year (TONs)
PM 10	0.125565
PM 2.5	0.107515
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.139047
N_2O	0.027128

Pollutant	Emissions Per Year (TONs)
CO_2	3306.811712
CO_2e	3317.893945

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		8075
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38Cs and LTOs

- Activity Description:
By 2037, remove 47 T-38Cs and 3,928 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-15.551618
SO_x	-1.646193
NO_x	-6.375401
CO	-172.578201

Pollutant	Emissions Per Year (TONs)
PM 10	-4.617980
PM 2.5	-4.189248
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.198984
N_2O	-0.038865

Pollutant	Emissions Per Year (TONs)
CO_2	-4739.094632
CO_2e	-4754.965478

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-14.420802
SO_x	-1.376657
NO_x	-2.203340
CO	-165.174913

Pollutant	Emissions Per Year (TONs)
PM 10	-4.007274
PM 2.5	-3.604403
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.173304
N_2O	-0.033812

Pollutant	Emissions Per Year (TONs)
CO_2	-4121.529714
CO_2e	-4135.342340

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.662888
SO_x	-0.140787
NO_x	-0.592717
CO	-6.631159

Pollutant	Emissions Per Year (TONs)
PM 10	-0.087200
PM 2.5	-0.078688
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.017723
N_2O	-0.003458

Pollutant	Emissions Per Year (TONs)
CO_2	-421.497423
CO_2e	-422.910002

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.467928
SO_x	-0.128750
NO_x	-3.579344
CO	-0.772129

Pollutant	Emissions Per Year (TONs)
PM 10	-0.523507
PM 2.5	-0.506157
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007956
N_2O	-0.001596

Pollutant	Emissions Per Year (TONs)
CO_2	-196.067495
CO_2e	-196.713136

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R

Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 3928
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38.4 Auxiliary Power Unit (APU)

38.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

38.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

38.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

38.5 Aircraft Engine Test Cell

38.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 94

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

38.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

38.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

38.6 Aerospace Ground Equipment (AGE)

38.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 3928

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

38.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

38.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38C CPs

- Activity Description:
By 2037, remove 16,438 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-3.446301
SO_x	-0.889637
NO_x	-0.876308
CO	-63.309402

Pollutant	Emissions Per Year (TONs)
PM 10	-1.540874
PM 2.5	-1.382614
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.111995
N_2O	-0.021850

Pollutant	Emissions Per Year (TONs)
CO_2	-2663.457837
CO_2e	-2672.383976

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-3.446301
SO_x	-0.889637
NO_x	-0.876308
CO	-63.309402

Pollutant	Emissions Per Year (TONs)
PM 10	-1.540874
PM 2.5	-1.382614
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.111995
N_2O	-0.021850

Pollutant	Emissions Per Year (TONs)
CO_2	-2663.457837
CO_2e	-2672.383976

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 16438
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

Sheppard AFB ROI: Alternative 2 GHG Report

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2031	2,707	0.10583419	0.03961577	2,720	68,039	No
2032	1,302	0.04990581	0.02445684	1,310	68,039	No
2033	391	0.01044379	0.00695799	393	68,039	No
2034	17,210	0.70951398	0.14264814	17,268	68,039	No
2035	31,218	1.26823737	0.24883208	31,319	68,039	No
2036	41,056	1.65369425	0.32138286	41,187	68,039	No
2037	39,122	1.56892416	0.30279812	39,246	68,039	No
2038 [SS Year]	39,122	1.56892416	0.30279812	39,246	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	700,652,689	3,554,625	135,896	836,194,567
2032	700,652,689	3,554,625	135,896	836,194,567
2033	700,652,689	3,554,625	135,896	836,194,567
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2032	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2033	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2031-2038	State Total	5,605,221,516	28,436,999	1,087,166	6,689,556,535
2031-2038	U.S. Total	41,091,633,432	205,015,293	12,005,661	50,013,561,837
2031-2038	Action	172,128	6.935478	1.38949	172,690
Percent of State Totals		0.00307085%	0.00002439%	0.00012781%	0.00258149%
Percent of U.S. Totals		0.00041889%	0.00000338%	0.00001157%	0.00034529%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00004627%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Sheppard AFB ROI: Alternative 3 ACAM Report

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
_X_ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2031

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.904	250	No
NOx	10.892	250	No
CO	17.239	250	No
SOx	0.028	250	No
PM 10	16.479	250	No
PM 2.5	0.316	250	No
Pb	0.000	25	No
NH3	0.031	250	No

2032

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.734	250	No
NOx	4.917	250	No
CO	7.989	250	No
SOx	0.014	250	No
PM 10	0.154	250	No
PM 2.5	0.131	250	No
Pb	0.000	25	No
NH3	0.020	250	No

2033

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.163	250	No
NOx	0.255	250	No
CO	1.851	250	No
SOx	0.003	250	No
PM 10	0.027	250	No
PM 2.5	0.019	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	13.209	250	No
NOx	42.803	250	No
CO	-56.437	250	No
SOx	1.857	250	No
PM 10	-1.708	250	No
PM 2.5	-1.528	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	45.923	250	No
NOx	177.185	250	No
CO	-498.290	250	No
SOx	5.879	250	No
PM 10	-15.016	250	No
PM 2.5	-13.546	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	80.277	250	No
NOx	316.819	250	Yes
CO	-958.253	250	No
SOx	10.007	250	No
PM 10	-28.801	250	No
PM 2.5	-25.994	250	No
Pb	0.000	25	No
NH3	0.022	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	110.270	250	No
NOx	389.477	250	Yes
CO	-1053.955	250	No
SOx	13.457	250	No
PM 10	-32.013	250	No
PM 2.5	-28.876	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	110.270	250	No
NOx	389.477	250	Yes
CO	-1053.955	250	No
SOx	13.457	250	No
PM 10	-32.013	250	No
PM 2.5	-28.876	250	No
Pb	0.000	25	No
NH3	0.000	250	No

The steady state estimated annual net emissions associated with this action exceed the insignificance indicators, indicating a potential for a significant impact to air quality. Therefore, the ACAM analysis is inconclusive and further air quality impact assessment is needed.

Carolyn Hein, Contractor — Apr 23 2025

Name, Title — **Date**

Sheppard AFB ROI: Alternative 3 ACAM Detail Report

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2031

- Action Purpose and Need:
The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:
The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating

those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Ground-Based Training System (GBTS) Facility
3.	Heating	GBTS Facility (Heating)
4.	Construction / Demolition	Maintenance Hangar/Unit Maintenance Training (UMT) Facility
5.	Heating	UMT Facility (Heating)
6.	Construction / Demolition	Ramp Expansion
7.	Construction / Demolition	Hush House Pad
8.	Construction / Demolition	T-7A Shelters
9.	Construction / Demolition	Addition to Egress Shop
10.	Heating	Addition to Egress Shop (Heating)
11.	Construction / Demolition	Construct Jet Blast Deflectors
12.	Construction / Demolition	Airfield Improvements
13.	Paint Booth	Airfield Improvements (Painting)
14.	Construction / Demolition	Renovate Squad Operations 1
15.	Construction / Demolition	Renovate Squad Operations 2
16.	Construction / Demolition	Hangar Renovation
17.	Construction / Demolition	Remove Aboveground Service Modules of the CASS
18.	Construction / Demolition	Compass Rose & Trim Pad
19.	Paint Booth	Compass Rose & Trim Pad (Painting)
20.	Construction / Demolition	Munitions Storage for T-7A
21.	Construction / Demolition	Hammerhead Expansion
22.	Construction / Demolition	Support Mechanized Material Handling System (in T-7A parts Warehouse)
23.	Personnel	Transitional Increase of 100 Personnel
24.	Aircraft	2034 Add T-7As and LTOs
25.	Aircraft	2034 Add T-7A CPs
26.	Aircraft	2034 Remove T-38C LTOs
27.	Aircraft	2034 Remove T-38C CPs
28.	Aircraft	2035 Add T-7As and LTOs
29.	Aircraft	2035 Add T-7A CPs
30.	Aircraft	2035 Remove T-38Cs and LTOs
31.	Aircraft	2035 Remove T-38C CPs
32.	Aircraft	2036 Add T-7As and LTOs
33.	Aircraft	2036 Add T-7A CPs
34.	Aircraft	2036 Remove T-38Cs and LTOs
35.	Aircraft	2036 Remove T-38C CPs
36.	Aircraft	2037 Add T-7A LTOs
37.	Aircraft	2037 Add T-7A CPs
38.	Aircraft	2037 Remove T-38Cs and LTOs
39.	Aircraft	2037 Remove T-38C CPs

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ground-Based Training System (GBTS) Facility

- Activity Description:
Construction of the GBTS facility would occur over a 2-year period from January 2031 through December 2032. Construction would include renovation of an existing facility (estimated at 30,000 SF) and construction of a 16,000 SF addition. Associated parking would be constructed along Avenue J (approx. 100,000 SF).

Site grading would occur on the site for new construction and pavements (approx. 116,000 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

It was assumed 25 percent of the total square footage of the renovations (approx. 30,000 SF) would be construction to equate the renovations (30,000 SF * 0.25 = 7,500 SF). New construction would include a 16,000 SF addition. Total construction for the GBTS facility was estimated at 37,500 SF. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,000 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 100,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.767447
SO_x	0.004973
NO_x	1.847399
CO	2.857429

Pollutant	Total Emissions (TONs)
PM 10	2.393357
PM 2.5	0.048628
Pb	0.000000
NH_3	0.005399

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.019673
N_2O	0.007686

Pollutant	Total Emissions (TONs)
CO_2	504.564739
CO_2e	507.152392

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 116000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)

20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 37500

Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1

Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 100000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: GBTS Facility (Heating)

- Activity Description:
Heating/cooling for the GBTS facility addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
GBTS Facility Addition – 16,000 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.002397
SO_x	0.000261
NO_x	0.043581
CO	0.036608

Pollutant	Emissions Per Year (TONs)
PM 10	0.003312
PM 2.5	0.003312
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000985
N_2O	0.000985

Pollutant	Emissions Per Year (TONs)
CO_2	52.305423
CO_2e	52.594008

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 16000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0572

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

3.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Maintenance Hangar/Unit Maintenance Training (UMT) Facility

- Activity Description:

Construction of the UMT facility (46,500 SF) would occur over a 2-year period from January 2031 through December 2032. An approximately 15,000 SF parking area would also be constructed.

Site grading would occur on the site for new construction and pavements (approx. 61,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for site utilities would require approximately 500 feet of excavation. A 3-foot trench width for utilities was assumed, for a total of 1,500 SF. Trenching would begin in March 2032 and last approximately 2 months.

Construction would include the 46,500-SF UMT facility. The height of construction was assumed to be 30 feet. Construction would begin in May 2031 and last approximately 16 months.

Architectural coatings would be applied to the facility, totaling 46,500 SF. Architectural coating application would begin in September 2032 and last approximately 2 months.

Paving for the parking area would occur on an area totaling approximately 15,000 SF. Paving would begin November 2032 and last approximately 2 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.759672
SO_x	0.004743
NO_x	1.757835
CO	2.698828

Pollutant	Total Emissions (TONs)
PM 10	1.305911
PM 2.5	0.045534
Pb	0.000000
NH_3	0.005541

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.018675
N_2O	0.008118

Pollutant	Total Emissions (TONs)
CO_2	482.352228
CO_2e	485.026336

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 61500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**

Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 46500
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887

MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 46500
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

4.5 Paving Phase

4.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 2
Number of Days: 0

4.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

4.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

5. Heating

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: UMT Facility (Heating)

- Activity Description:
Heating/cooling for the UMT facility would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
UMT Facility – 46,500 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007892
SO_x	0.000861
NO_x	0.143486
CO	0.120528

Pollutant	Emissions Per Year (TONs)
PM 10	0.010905
PM 2.5	0.010905
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003243
N_2O	0.003243

Pollutant	Emissions Per Year (TONs)
CO_2	172.210119
CO_2e	173.160253

5.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 46500
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0648

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

5.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

5.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ramp Expansion

- Activity Description:

Ramp expansion would include grading and paving new ramp areas. Activities would occur over a 2-year period starting in January 2031.

Site grading would occur on the entire area (approx. 60,000 SF). Site grading would begin in January 2031 and last approximately 12 months.

Paving would occur on approximately 60,000 SF. Paving would begin January 2032 and last approximately 12 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.223808
SO_x	0.004137
NO_x	1.747959
CO	2.696316

Pollutant	Total Emissions (TONs)
PM 10	7.235707
PM 2.5	0.066310
Pb	0.000000
NH_3	0.003490

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.017588
N_2O	0.003891

Pollutant	Total Emissions (TONs)
CO_2	439.110329
CO_2e	440.634041

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 60000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)

20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

6.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 60000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55245	0.00854	4.19397	3.25427	0.16245	0.14946
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18992	0.00486	2.01767	3.42447	0.07875	0.07245
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.15717	0.00487	1.70774	3.37751	0.04850	0.04462
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.42190	0.00542	3.41206	4.00506	0.10233	0.09414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.10601	572.06247
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hush House Pad

- Activity Description:
Construction of the hush house pad (27,500 SF) would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the entire site (27,500 SF). Site grading would begin in January 2031 and last approximately 4 months.

Trenching for the reinforced concrete and utilities would occur over the entire site (27,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in May 2031 and last approximately 4 months.

Construction of the new hush house pad would total approximately 27,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in September 2031 and last approximately 16 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 0
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.191392
SO_x	0.003579
NO_x	1.526256
CO	2.354629

Pollutant	Total Emissions (TONs)
PM 10	2.239433
PM 2.5	0.045659
Pb	0.000000
NH_3	0.003939

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.014222
N_2O	0.003307

Pollutant	Total Emissions (TONs)
CO_2	356.767753
CO_2e	358.042202

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4

Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928

Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.2 Trenching/Excavating Phase

7.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 4
Number of Days: 0

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 27500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887

MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7.3 Building Construction Phase

7.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 16
Number of Days: 0

7.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 27500
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Concrete/Industrial Saws Composite	1	8
Generator Sets Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	0
Plate Compactors Composite	1	8
Rollers Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621

Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)

BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: T-7A Shelters

- Activity Description:

Construction of 131 aircraft shelters (sunshades) would occur over a 2-year period from January 2031 through December 2032.

Demolition would be required for the existing T-38C shelters. Demolition would include removal of 131 sunshades totaling approximately 295,000 SF. Demolition would begin in January 2031 and last approximately 12 months.

Construction would include installation of 131 T-7A sunshades totaling approximately 295,000 SF. The height of all sunshades were assumed to be 15 feet. Construction would begin in January 2032 and last approximately 12 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.198054
SO_x	0.004904
NO_x	1.712015
CO	2.783569

Pollutant	Total Emissions (TONs)
PM 10	0.985626
PM 2.5	0.042658
Pb	0.000000
NH_3	0.011951

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.020365
N_2O	0.024701

Pollutant	Total Emissions (TONs)
CO_2	588.598180
CO_2e	595.714083

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration

Number of Month: 12
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information

Area of Building to be demolished (ft^2): 295000
Height of Building to be demolished (ft): 15

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374

LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1\ yd^3 / 27\ ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Building Construction Phase

8.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 12
Number of Days: 0

8.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 295000
Height of Building (ft): 15
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	2	7
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16757	0.00487	1.25709	1.55759	0.05276	0.04854
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19055	0.00487	1.77383	3.55935	0.05272	0.04850
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53211	0.00793	4.25580	2.83928	0.16416	0.15103
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15988	0.00489	1.61021	3.49533	0.03433	0.03158
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.34949	0.00735	3.21107	4.36083	0.03339	0.03072

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30495	570.25522
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30587	570.25615

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

8.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop

- Activity Description:
Construction of the addition to the egress shop would occur over a 2-year period from January 2031 through December 2032.

Site grading would occur on the site of the addition, 3,400 SF. Site grading would begin in January 2031 and last approximately 1 month.

Construction of the egress shop addition would total approximately 3,400 SF. The height of the addition was assumed to be 20 feet. Construction would begin in February 2031 and last approximately 22 months.

Architectural coatings would be applied to the addition, totaling 3,400 SF. Architectural coating application would begin in December 2032 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2032

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.143878
SO_x	0.002583
NO_x	0.805008
CO	1.473874

Pollutant	Total Emissions (TONs)
PM 10	0.063196
PM 2.5	0.026319
Pb	0.000000
NH_3	0.002309

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011335
N_2O	0.002639

Pollutant	Total Emissions (TONs)
CO_2	283.411958
CO_2e	284.428557

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.2 Building Construction Phase

9.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 22
Number of Days: 0

9.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3400
Height of Building (ft): 20
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

9.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

9.3 Architectural Coatings Phase

9.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2032

- Phase Duration
Number of Month: 1
Number of Days: 0

9.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 3400
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

9.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

10. Heating

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Addition to Egress Shop (Heating)

- Activity Description:
Heating/cooling for the new addition would begin following the construction period, or approximately January 2033. Heating/cooling would be required as follows:
Addition to the Egress Shop – 3,400 SF

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000845
SO_x	0.000092
NO_x	0.015365
CO	0.012906

Pollutant	Emissions Per Year (TONs)
PM 10	0.001168
PM 2.5	0.001168
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000347
N_2O	0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	18.440634
CO_2e	18.542376

10.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 3400
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0949

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

10.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3
5.5	0.6	100	84	7.6	7.6		

- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)

CH_4	N_2O	CO_2	CO_2e
2.26	2.26	120019	120143

10.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption

EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Jet Blast Deflectors

- Activity Description:
Construction of the jet blast deflectors would occur over a 2-year period from January 2031 through December 2032.

Construction of the deflectors would total approximately 2,000 SF. The height of the deflectors was assumed to be 12 feet. Construction would begin in January 2031 and last approximately 24 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2033

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.101013
SO_x	0.002586
NO_x	0.774680
CO	1.461830

Pollutant	Total Emissions (TONs)
PM 10	0.027217
PM 2.5	0.024360
Pb	0.000000
NH_3	0.002352

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.011342
N_2O	0.002520

Pollutant	Total Emissions (TONs)
CO_2	283.219970
CO_2e	284.205261

11.1 Building Construction Phase

11.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 24
Number of Days: 0

11.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

11.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

11.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements

- Activity Description:

Airfield improvements would include airfield markings, installation of mooring and anchor rods, replacing the aircraft arresting system, and removing aboveground service modules of the Centralized Aircraft Support System (CASS). Activities would occur over a 1-year period starting in January 2031 (painting activities would occur from September through December 2031 and are captured in a separate Paint Booth activity).

Trenching/excavation for the mooring and anchor rods was estimated to occur on 100 SF. Excavation for replacing the arresting system may be required (approx. 1,000 SF). Total excavation was estimated at 1,100 SF. Excavation would begin in January 2031 and last approximately 2 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

The construction activity was used to characterize removal of existing airfield markings. Grinders would likely be used to remove existing paint, estimated at 50,000 SF. Paint removal would begin in March 2031 and last approximately 5 months.

- Activity Start Date

Start Month: 1
Start Month: 2031

- Activity End Date

Indefinite: False
End Month: 7
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.033345
SO_x	0.000641
NO_x	0.279630
CO	0.393083

Pollutant	Total Emissions (TONs)
PM 10	0.027621
PM 2.5	0.005028
Pb	0.000000
NH_3	0.000738

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.002210
N_2O	0.000640

Pollutant	Total Emissions (TONs)
CO_2	56.045595
CO_2e	56.277179

12.1 Trenching/Excavating Phase

12.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration

Number of Month: 2
Number of Days: 0

12.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1100
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

12.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

12.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12.2 Building Construction Phase

12.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 5
Number of Days: 0

12.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 50000
Height of Building (ft): 1
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

12.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702

MC	0.10118	0.00284	394.03643	397.62186

12.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

13. Paint Booth

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Improvements (Painting)

- Activity Description:
Painting activities would be a continuation of the airfield improvements construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in August 2031 and last approximately 5 months.

- Activity Start Date
Start Month: 8
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.011873
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

13.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

13.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 1

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 165,000 SF) would be construction to equate the renovations (165,000 SF * 0.25 = 41,250 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (165,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12

End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.036021
SO_x	0.002744
NO_x	0.982507
CO	1.500633

Pollutant	Total Emissions (TONs)
PM 10	0.027778
PM 2.5	0.023494
Pb	0.000000
NH_3	0.003633

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010656
N_2O	0.005897

Pollutant	Total Emissions (TONs)
CO_2	280.268179
CO_2e	282.129405

14.1 Building Construction Phase

14.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

14.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 41250
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

14.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

14.2 Architectural Coatings Phase

14.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

14.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 165000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

14.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

14.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Squad Operations 2

- Activity Description:
Renovations would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 100,000 SF) would be construction to equate the renovations (100,000 SF * 0.25 = 25,000 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (100,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.281448
SO_x	0.002710
NO_x	0.968997
CO	1.488778

Pollutant	Total Emissions (TONs)
PM 10	0.026657
PM 2.5	0.023040
Pb	0.000000
NH_3	0.003041

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.010474
N_2O	0.004443

Pollutant	Total Emissions (TONs)
CO_2	270.068383
CO_2e	271.539060

15.1 Building Construction Phase

15.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

15.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 25000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

15.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

15.2 Architectural Coatings Phase

15.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

15.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 100000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

15.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

15.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hangar Renovation

- Activity Description:
Modification of either Building 2404, 2406, 2408, or 2410 would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the hangar (approx. 40,000 SF) would be construction to equate the renovations (40,000 SF * 0.25 = 10,000 SF). The height of the hangar was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 11 months.

It was assumed architectural coatings would be required for the entire facility (40,000 SF) following the renovations. Architectural coating application would begin in December 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.575177
SO_x	0.002406
NO_x	0.881174
CO	1.389029

Pollutant	Total Emissions (TONs)
PM 10	0.022338
PM 2.5	0.019599
Pb	0.000000
NH_3	0.002494

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.009110
N_2O	0.002861

Pollutant	Total Emissions (TONs)
CO_2	231.143070
CO_2e	232.156290

16.1 Building Construction Phase

16.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 11
Number of Days: 0

16.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 10000
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

16.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35922	0.00735	3.23985	4.37186	0.03892	0.03580

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30593	570.25621
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.30362	570.25389

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

16.2 Architectural Coatings Phase

16.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

16.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 40000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

16.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

16.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

17. Construction / Demolition

17.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Remove Aboveground Service Modules of the CASS

- Activity Description:
Removal of T-38C CASS modules would occur over a 1-year period starting in January 2031.

It was assumed approximately 1,000 SF would be excavated and filled for CASS removal. Excavation would begin in January 2031 and last approximately 12 months. Assumed no materials are required to be hauled on- or off-site; excavated spoils will be used on-site.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.047432
SO_x	0.000912
NO_x	0.417206
CO	0.720250

Pollutant	Total Emissions (TONs)
PM 10	0.127785
PM 2.5	0.007411
Pb	0.000000
NH_3	0.001162

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.003996
N_2O	0.000890

Pollutant	Total Emissions (TONs)
CO_2	100.176741
CO_2e	100.524406

17.1 Trenching/Excavating Phase

17.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

17.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

17.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

17.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18. Construction / Demolition

18.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad

- Activity Description:
Repairs and preparation of existing aircraft pavement for a compass rose and trim pad would occur over aa 1-year period starting in January 2031 (compass rose painting activities would occur from November through December 2031 and are captured in a separate Paint Booth activity).

Site grading would occur on the site for the compass rose/trim pad and access road (approx. 30,000 SF). Site grading would begin in January 2031 and last approximately 3 months.

Excavation would occur over the entire site (30,000 SF). It was assumed excavated fill would be reused in place. Trenching would begin in April 2031 and last approximately 3 months.

Construction of the compass rose and trim pad would total approximately 15,000 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in July 2031 and last approximately 3 months.

Paving for the access road would occur on approximately 15,000 SF. Paving would begin in October 2031 and last approximately 1 month.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.068650
SO_x	0.001254
NO_x	0.553532
CO	0.812319

Pollutant	Total Emissions (TONs)
PM 10	1.809833
PM 2.5	0.017326
Pb	0.000000
NH_3	0.001088

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005099
N_2O	0.001213

Pollutant	Total Emissions (TONs)
CO_2	127.632549
CO_2e	128.096865

18.1 Site Grading Phase

18.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036

HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.2 Trenching/Excavating Phase

18.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.3 Building Construction Phase

18.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1

Start Year: 2031

- Phase Duration
Number of Month: 3
Number of Days: 0

18.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 15000
Height of Building (ft): 2
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	2	8
Generator Sets Composite	1	8
Pressure Washers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

18.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33196	0.00741	3.22099	4.22718	0.03631	0.03341
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53249	0.00793	4.25997	2.83929	0.16510	0.15189
Pressure Washers Composite [HP: 14] [LF: 0.3]						

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.51763	0.00858	4.27809	3.23942	0.16821	0.15476

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02325	0.00465	573.26828	575.23559
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02305	0.00461	568.30593	570.25621
Pressure Washers Composite [HP: 14] [LF: 0.3]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02346	0.00469	578.39247	580.37736

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

18.4 Paving Phase

18.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 1
Number of Days: 0

18.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

18.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.84622	527.65079
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

18.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

19. Paint Booth

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Compass Rose & Trim Pad (Painting)

- Activity Description:
Painting activities would be a continuation of the compass rose & trim pad construction activity. Painting was estimated at 150 gallons. Asphalt/Concrete Paint would be used (TT-P-1952E Type III used as surrogate to estimate for VOC content). Painting would begin in November 2031 and last approximately 2 months.

- Activity Start Date
Start Month: 11
Start Year: 2031

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.004749
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Total Emissions (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.000000
N_2O	0.000000

Pollutant	Total Emissions (TONs)
CO_2	0.000000
CO_2e	0.000000

19.2 Paint Booth Assumptions

- Paint Booth
Coating throughput (gallons/year): 150

- Default Settings Used: No

- Paint Booth Consumption
Coating used: Asphlat/Concrete Paint (TT-P-1952E Type III used as surrogate)
Specific gravity of coating: 1.4
Coating VOC content by weight (%): 6.5
Efficiency of control device (%): 50

19.3 Paint Booth Formula(s)

- Paint Booth Emissions per Year
PBE_{VOC}= (VOC / 100) * CT * SG * 8.35 * (1 - (CD / 100)) / 2000

PBE_{VOC}: Paint Booth VOC Emissions (TONs per Year)
VOC: Coating VOC content by weight (%)
(VOC / 100): Conversion Factor percent to decimal
CT: Coating throughput (gallons/year)
SG: Specific gravity of coating
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

20. Construction / Demolition

20.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Munitions Storage for T-7A

- Activity Description:
Construction of the concrete pad for munitions storage would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,600 SF). Site grading would begin in January 2031 and last approximately 2 months.

Trenching for the concrete pad would occur over the entire site (3,600 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the pad would total approximately 3,600 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582613
CO	0.932667

Pollutant	Total Emissions (TONs)
PM 10	0.165142
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001377

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001309

Pollutant	Total Emissions (TONs)
CO_2	144.008411
CO_2e	144.516483

20.1 Site Grading Phase

20.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.2 Trenching/Excavating Phase

20.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

20.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

20.3 Building Construction Phase

20.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

20.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3600
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

20.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671

LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

20.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21. Construction / Demolition

21.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Hammerhead Expansion

- Activity Description:
Construction for the hammerhead expansion would occur over a 1-year period starting in January 2031.

Site grading would occur on the entire site (3,500 SF). Site grading would begin in January 2031 and last approximately 2 months.

Excavation would occur over the entire site (3,500 SF). It was assumed excavated fill would be reused in place. Trenching would begin in March 2031 and last approximately 2 months.

Construction of the hammerhead expansion would total approximately 3,500 SF. Construction would include concrete mixers, rollers, and similar equipment. Construction would begin in May 2031 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12

End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.071809
SO_x	0.001359
NO_x	0.582599
CO	0.932655

Pollutant	Total Emissions (TONs)
PM 10	0.161162
PM 2.5	0.019739
Pb	0.000000
NH_3	0.001376

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005755
N_2O	0.001308

Pollutant	Total Emissions (TONs)
CO_2	143.997949
CO_2e	144.505622

21.1 Site Grading Phase

21.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24983	0.00490	1.68099	3.41141	0.09568	0.08803
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.21522	0.00487	2.15545	3.47633	0.09705	0.08928
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.32342	0.00491	2.66538	2.60458	0.12405	0.11412
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02154	0.00431	531.04687	532.86928
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02137	0.00427	526.88032	528.68844
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.38223	534.20923
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.2 Trenching/Excavating Phase

21.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 2
Number of Days: 0

21.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

21.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.30767	0.00543	3.28327	4.16592	0.05781	0.05318

Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.36454	0.00543	3.36875	4.50643	0.05884	0.05414
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.06593	590.08402
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02384	0.00477	587.81454	589.83177
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

21.3 Building Construction Phase

21.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 8
Number of Days: 0

21.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3500
Height of Building (ft): 5
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	8
Pavers Composite	1	8
Paving Equipment Composite	1	8
Plate Compactors Composite	1	8
Rollers Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

21.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.55254	0.00855	4.19473	3.25479	0.16253	0.14953
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19401	0.00486	2.08707	3.42646	0.08314	0.07648
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.15932	0.00487	1.73380	3.38321	0.04997	0.04598
Plate Compactors Composite [HP: 8] [LF: 0.43]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**

Emission Factors	0.54671	0.00884	4.14272	3.46996	0.16188	0.14893
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.44496	0.00542	3.44295	4.03665	0.11101	0.10213

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.19781	572.15458
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.84622	527.65079
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61090	529.42153
Plate Compactors Composite [HP: 8] [LF: 0.43]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29423	570.24447
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.11055	589.12536

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

21.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

22. Construction / Demolition

22.1 General Information & Timeline Assumptions

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Support Mechanized Material Handling System (in T-7A parts Warehouse)

- Activity Description:
Renovations for interior electrical support would occur over a 1-year period starting in January 2031.

It was assumed 25 percent of the total square footage of the building (approx. 10,000 SF) would be construction to equate the renovations (10,000 SF * 0.25 = 2,500 SF). The height of the buildings was assumed to be 30 feet. Renovations would begin in January 2031 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.050581
SO_x	0.001297
NO_x	0.389086
CO	0.732447

Pollutant	Total Emissions (TONs)
PM 10	0.013753
PM 2.5	0.012239
Pb	0.000000
NH_3	0.001253

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.005695
N_2O	0.001448

Pollutant	Total Emissions (TONs)
CO_2	142.928113
CO_2e	143.471229

22.1 Building Construction Phase

22.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

- Phase Duration
Number of Month: 12
Number of Days: 0

22.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2500

Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

22.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.17419	0.00487	1.34722	1.58777	0.05874	0.05404
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19598	0.00487	1.83160	3.56245	0.05737	0.05278
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.16247	0.00489	1.63682	3.49664	0.03656	0.03363

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.61055	529.42117
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.07594	528.88473
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02147	0.00429	529.26401	531.08031

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25685	0.00224	0.07536	3.18708	0.01935	0.00660	0.04414
LDGT	0.20366	0.00297	0.10721	2.86080	0.02047	0.00734	0.03690
HDGV	0.56373	0.00661	0.34441	6.67526	0.04270	0.02019	0.08172
LDDV	0.09903	0.00124	0.15591	7.22209	0.02244	0.00823	0.01671
LDDT	0.08775	0.00120	0.15821	2.61242	0.02012	0.00731	0.01546
HDDV	0.06662	0.00397	1.57106	1.37852	0.13026	0.05281	0.06887
MC	2.57330	0.00304	0.60648	11.25596	0.03094	0.02161	0.05606

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01089	0.00449	285.08077	286.57459
LDGT	0.01136	0.00629	378.96017	380.94613
HDGV	0.03450	0.02086	841.51932	848.01374
LDDV	0.04907	0.00067	369.86331	371.41539
LDDT	0.02422	0.00098	359.27208	360.21036
HDDV	0.02114	0.16914	1186.09183	1231.50702
MC	0.10118	0.00284	394.03643	397.62186

22.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

23. Personnel

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Transitional Increase of 100 Personnel

- Activity Description:
Increase of 100 personnel during the T-7A and T-38C transition period (i.e., 2033 through 2036). Assumed all personnel commute daily.

- Activity Start Date
Start Month: 1
Start Year: 2033

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2036

- Activity Emissions of Criteria Pollutants:

Pollutant	Total Emissions (TONs)
VOC	0.607366
SO_x	0.005903
NO_x	0.211956
CO	6.723078

Pollutant	Total Emissions (TONs)
PM 10	0.045211
PM 2.5	0.016428
Pb	0.000000
NH_3	0.088579

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Total Emissions (TONs)
CH_4	0.027749
N_2O	0.012380

Pollutant	Total Emissions (TONs)
CO_2	753.334934
CO_2e	757.394193

23.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 100
Civilian Personnel: 0
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

23.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

23.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.25418	0.00210	0.06585	2.90895	0.01876	0.00647	0.04233
LDGT	0.20052	0.00286	0.09270	2.68756	0.01996	0.00714	0.03585
HDGV	0.52890	0.00655	0.29513	6.07732	0.04127	0.01931	0.08206
LDDV	0.09228	0.00124	0.14059	7.44001	0.02278	0.00874	0.01684
LDDT	0.07431	0.00115	0.12481	2.41221	0.01970	0.00705	0.01527
HDDV	0.05762	0.00390	1.37962	1.33933	0.12436	0.04792	0.06921
MC	2.54108	0.00304	0.60490	11.11798	0.03078	0.02161	0.05640

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01002	0.00438	267.46963	268.91076
LDGT	0.01058	0.00613	364.36705	366.28905
HDGV	0.03206	0.02033	834.70184	840.98717
LDDV	0.04934	0.00067	368.02625	369.58553
LDDT	0.02373	0.00098	344.66551	345.59058
HDDV	0.02092	0.16975	1164.86428	1210.43459
MC	0.09969	0.00284	394.07263	397.61557

23.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7As and LTOs

- Activity Description:
In 2034, add 28 T-7As and 2,646 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	20.537982
SO_x	1.590575
NO_x	19.785336
CO	65.957790

Pollutant	Emissions Per Year (TONs)
PM 10	1.215401
PM 2.5	1.111898
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.188406
N_2O	0.036142

Pollutant	Emissions Per Year (TONs)
CO_2	4651.541883
CO_2e	4666.394913

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	19.059971
SO_x	1.213310
NO_x	13.431044
CO	39.652896

Pollutant	Emissions Per Year (TONs)
PM 10	0.288689
PM 2.5	0.255386
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.146472
N_2O	0.027931

Pollutant	Emissions Per Year (TONs)
CO_2	3649.640288
CO_2e	3661.143321

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.162803
SO_x	0.290536
NO_x	3.943155
CO	25.784768

Pollutant	Emissions Per Year (TONs)
PM 10	0.574064
PM 2.5	0.515552
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.036575
N_2O	0.007136

Pollutant	Emissions Per Year (TONs)
CO_2	869.825578
CO_2e	872.740655

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.315208
SO_x	0.086729
NO_x	2.411136
CO	0.520126

Pollutant	Emissions Per Year (TONs)
PM 10	0.352647
PM 2.5	0.340960
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005359
N_2O	0.001075

Pollutant	Emissions Per Year (TONs)
CO_2	132.076016
CO_2e	132.510936

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2646
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 17.16
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24.4 Auxiliary Power Unit (APU)

24.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

24.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

24.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

24.5 Aircraft Engine Test Cell

24.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 28

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 3
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

24.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

24.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

24.6 Aerospace Ground Equipment (AGE)

24.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 2646

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

24.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8

MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

24.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Add T-7A CPs

- Activity Description:
In 2034, add 11,074 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	2.708043
SO_x	1.514742
NO_x	24.495612
CO	4.348402

Pollutant	Emissions Per Year (TONs)
PM 10	0.172199
PM 2.5	0.147446
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.190688
N_2O	0.037203

Pollutant	Emissions Per Year (TONs)
CO_2	4534.939059
CO_2e	4550.137158

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	2.708043
SO_x	1.514742
NO_x	24.495612
CO	4.348402

Pollutant	Emissions Per Year (TONs)
PM 10	0.172199
PM 2.5	0.147446
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.190688
N_2O	0.037203

Pollutant	Emissions Per Year (TONs)
CO_2	4534.939059
CO_2e	4550.137158

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 11074
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 1.59
Climb Out [Intermediate] (mins): 1.15
Takeoff [Military] (mins): 0.34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Remove T-38C LTOs

- Activity Description:
In 2034, decrease T-38C LTOs by 2,315.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-8.168078
SO_x	-0.726629
NO_x	-1.216621
CO	-91.273668

Pollutant	Emissions Per Year (TONs)
PM 10	-2.214141
PM 2.5	-1.991854
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.091474
N_2O	-0.017847

Pollutant	Emissions Per Year (TONs)
CO_2	-2175.432134
CO_2e	-2182.722736

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-8.168078
SO_x	-0.726629
NO_x	-1.216621
CO	-91.273668

Pollutant	Emissions Per Year (TONs)
PM 10	-2.214141
PM 2.5	-1.991854
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.091474
N_2O	-0.017847

Pollutant	Emissions Per Year (TONs)
CO_2	-2175.432134
CO_2e	-2182.722736

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2315
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 10
Intermediate (mins): 7.5
Military (mins): 2
AfterBurn (mins): 0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26.4 Auxiliary Power Unit (APU)

26.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

26.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

26.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034 Remove T-38C CPs

- Activity Description:
In 2034, decrease T-38C LTOs by 9,690.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-2.031552
SO_x	-0.524430
NO_x	-0.516573
CO	-37.320118

Pollutant	Emissions Per Year (TONs)
PM 10	-0.908327
PM 2.5	-0.815034
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.066019
N_2O	-0.012880

Pollutant	Emissions Per Year (TONs)
CO_2	-1570.075827
CO_2e	-1575.337677

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.031552
SO_x	-0.524430
NO_x	-0.516573
CO	-37.320118

Pollutant	Emissions Per Year (TONs)
PM 10	-0.908327
PM 2.5	-0.815034
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.066019
N_2O	-0.012880

Pollutant	Emissions Per Year (TONs)
CO_2	-1570.075827
CO_2e	-1575.337677

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		9690
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7As and LTOs

- Activity Description:
In 2035, add 48 T-7As and 10,144 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	75.446040
SO_x	5.020330
NO_x	60.132903
CO	196.891373

Pollutant	Emissions Per Year (TONs)
PM 10	3.390490
PM 2.5	3.125254
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.586654
N_2O	0.112095

Pollutant	Emissions Per Year (TONs)
CO_2	14606.853611
CO_2e	14652.985052

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	72.244246
SO_x	4.189775
NO_x	44.129608
CO	150.694902

Pollutant	Emissions Per Year (TONs)
PM 10	1.054432
PM 2.5	0.934309
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.503408
N_2O	0.095741

Pollutant	Emissions Per Year (TONs)
CO_2	12609.382738
CO_2e	12648.849547

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.993377
SO_x	0.498061
NO_x	6.759695
CO	44.202460

Pollutant	Emissions Per Year (TONs)
PM 10	0.984110
PM 2.5	0.883803
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.062700
N_2O	0.012233

Pollutant	Emissions Per Year (TONs)
CO_2	1491.129563
CO_2e	1496.126838

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.208418
SO_x	0.332495
NO_x	9.243600
CO	1.994011

Pollutant	Emissions Per Year (TONs)
PM 10	1.351948
PM 2.5	1.307143
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.020546
N_2O	0.004121

Pollutant	Emissions Per Year (TONs)
CO_2	506.341310
CO_2e	508.008668

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		10144
Number of Annual Trim Test(s) per Aircraft:		9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28.4 Auxiliary Power Unit (APU)

28.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

28.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

28.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

28.5 Aircraft Engine Test Cell

28.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 48

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	3
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

28.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

28.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

28.6 Aerospace Ground Equipment (AGE)

28.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 10144

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

28.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

28.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Add T-7A CPs

- Activity Description:
In 2035, add 42,451 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	10.380995
SO_x	5.806602
NO_x	93.901320
CO	16.669135

Pollutant	Emissions Per Year (TONs)
PM 10	0.660107
PM 2.5	0.565218
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.730981
N_2O	0.142614

Pollutant	Emissions Per Year (TONs)
CO_2	17384.206066
CO_2e	17442.466361

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	10.380995
SO_x	5.806602
NO_x	93.901320
CO	16.669135

Pollutant	Emissions Per Year (TONs)
PM 10	0.660107
PM 2.5	0.565218
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.730981
N_2O	0.142614

Pollutant	Emissions Per Year (TONs)
CO_2	17384.206066
CO_2e	17442.466361

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		42451
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38Cs and LTOs

- Activity Description:
By 2035, remove 28 T-38Cs and 11,577 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-42.956014
SO_x	-4.182744
NO_x	-17.069494
CO	-468.812745

Pollutant	Emissions Per Year (TONs)
PM 10	-12.816678
PM 2.5	-11.633533
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.502235
N_2O	-0.098115

Pollutant	Emissions Per Year (TONs)
CO_2	-11964.389456
CO_2e	-12004.452393

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-41.181976
SO_x	-3.719406
NO_x	-6.166981
CO	-462.586571

Pollutant	Emissions Per Year (TONs)
PM 10	-11.221798
PM 2.5	-10.094858
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.468228
N_2O	-0.091351

Pollutant	Emissions Per Year (TONs)
CO_2	-11135.414601
CO_2e	-11172.733104

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.394912
SO_x	-0.083873
NO_x	-0.353108
CO	-3.950478

Pollutant	Emissions Per Year (TONs)
PM 10	-0.051949
PM 2.5	-0.046878
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010559
N_2O	-0.002060

Pollutant	Emissions Per Year (TONs)
CO_2	-251.104848
CO_2e	-251.946384

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.379126
SO_x	-0.379465
NO_x	-10.549404
CO	-2.275697

Pollutant	Emissions Per Year (TONs)
PM 10	-1.542932
PM 2.5	-1.491797
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.023449
N_2O	-0.004703

Pollutant	Emissions Per Year (TONs)
CO_2	-577.870007
CO_2e	-579.772905

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 11577
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30.4 Auxiliary Power Unit (APU)

30.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

30.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

30.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

30.5 Aircraft Engine Test Cell

30.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 56

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

30.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

30.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

30.6 Aerospace Ground Equipment (AGE)

30.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 11577

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

30.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

30.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035 Remove T-38C CPs

- Activity Description:
By 2035, remove 48,450 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-10.157760
SO_x	-2.622152
NO_x	-2.582865
CO	-186.600592

Pollutant	Emissions Per Year (TONs)
PM 10	-4.541633
PM 2.5	-4.075170
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.330097
N_2O	-0.064402

Pollutant	Emissions Per Year (TONs)
CO_2	-7850.379135
CO_2e	-7876.688384

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-10.157760
SO_x	-2.622152
NO_x	-2.582865
CO	-186.600592

Pollutant	Emissions Per Year (TONs)
PM 10	-4.541633
PM 2.5	-4.075170
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.330097
N_2O	-0.064402

Pollutant	Emissions Per Year (TONs)
CO_2	-7850.379135
CO_2e	-7876.688384

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		48450
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7As and LTOs

- Activity Description:
In 2036, add 48 T-7As and 10,585 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	78.610268
SO_x	5.200696
NO_x	62.194404
CO	203.482850

Pollutant	Emissions Per Year (TONs)
PM 10	3.493265
PM 2.5	3.221125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.607388
N_2O	0.116038

Pollutant	Emissions Per Year (TONs)
CO_2	15128.440055
CO_2e	15176.196866

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	75.355939
SO_x	4.355685
NO_x	45.789253
CO	157.199692

Pollutant	Emissions Per Year (TONs)
PM 10	1.098433
PM 2.5	0.973352
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.523249
N_2O	0.099505

Pollutant	Emissions Per Year (TONs)
CO_2	13108.956512
CO_2e	13149.976205

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.993377
SO_x	0.498061
NO_x	6.759695
CO	44.202460

Pollutant	Emissions Per Year (TONs)
PM 10	0.984110
PM 2.5	0.883803
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.062700
N_2O	0.012233

Pollutant	Emissions Per Year (TONs)
CO_2	1491.129563
CO_2e	1496.126838

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.260952
SO_x	0.346950
NO_x	9.645456
CO	2.080699

Pollutant	Emissions Per Year (TONs)
PM 10	1.410722
PM 2.5	1.363969
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021439
N_2O	0.004300

Pollutant	Emissions Per Year (TONs)
CO_2	528.353980
CO_2e	530.093824

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		10585
Number of Annual Trim Test(s) per Aircraft:		9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32.4 Auxiliary Power Unit (APU)

32.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

32.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

32.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

32.5 Aircraft Engine Test Cell

32.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 48

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	3
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

32.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

32.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

32.6 Aerospace Ground Equipment (AGE)

32.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 10585

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

32.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

32.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Add T-7A CPs

- Activity Description:
In 2036, add 44,297 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	10.832417
SO_x	6.059104
NO_x	97.984659
CO	17.394000

Pollutant	Emissions Per Year (TONs)
PM 10	0.688812
PM 2.5	0.589796
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.762768
N_2O	0.148816

Pollutant	Emissions Per Year (TONs)
CO_2	18140.165747
CO_2e	18200.959516

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	10.832417
SO_x	6.059104
NO_x	97.984659
CO	17.394000

Pollutant	Emissions Per Year (TONs)
PM 10	0.688812
PM 2.5	0.589796
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.762768
N_2O	0.148816

Pollutant	Emissions Per Year (TONs)
CO_2	18140.165747
CO_2e	18200.959516

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		48
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		44297
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38Cs and LTOs

- Activity Description:
By 2036, remove 56 T-38Cs and 11,852 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-44.688505
SO_x	-4.447580
NO_x	-17.900539
CO	-489.799099

Pollutant	Emissions Per Year (TONs)
PM 10	-13.317476
PM 2.5	-12.086327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.534997
N_2O	-0.104509

Pollutant	Emissions Per Year (TONs)
CO_2	-12744.016195
CO_2e	-12786.691121

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-42.486796
SO_x	-3.891356
NO_x	-6.394328
CO	-479.568390

Pollutant	Emissions Per Year (TONs)
PM 10	-11.633996
PM 2.5	-10.465338
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.489874
N_2O	-0.095575

Pollutant	Emissions Per Year (TONs)
CO_2	-11650.209771
CO_2e	-11689.253525

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.789824
SO_x	-0.167746
NO_x	-0.706216
CO	-7.900955

Pollutant	Emissions Per Year (TONs)
PM 10	-0.103898
PM 2.5	-0.093755
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.021117
N_2O	-0.004120

Pollutant	Emissions Per Year (TONs)
CO_2	-502.209696
CO_2e	-503.892769

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-1.411886
SO_x	-0.388479
NO_x	-10.799995
CO	-2.329753

Pollutant	Emissions Per Year (TONs)
PM 10	-1.579582
PM 2.5	-1.527233
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.024006
N_2O	-0.004815

Pollutant	Emissions Per Year (TONs)
CO_2	-591.596728
CO_2e	-593.544828

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 11852
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34.4 Auxiliary Power Unit (APU)

34.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

34.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

34.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

34.5 Aircraft Engine Test Cell

34.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 112

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

34.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

34.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

34.6 Aerospace Ground Equipment (AGE)

34.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 11852

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

34.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

34.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036 Remove T-38C CPs

- Activity Description:
By 2036, remove 49,603 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-10.399492
SO_x	-2.684553
NO_x	-2.644331
CO	-191.041262

Pollutant	Emissions Per Year (TONs)
PM 10	-4.649713
PM 2.5	-4.172149
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.337953
N_2O	-0.065935

Pollutant	Emissions Per Year (TONs)
CO_2	-8037.200335
CO_2e	-8064.135685

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-10.399492
SO_x	-2.684553
NO_x	-2.644331
CO	-191.041262

Pollutant	Emissions Per Year (TONs)
PM 10	-4.649713
PM 2.5	-4.172149
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.337953
N_2O	-0.065935

Pollutant	Emissions Per Year (TONs)
CO_2	-8037.200335
CO_2e	-8064.135685

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		49603
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A LTOs

- Activity Description:
In 2037, add 7 T-7As and 5,513 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	39.944588
SO_x	2.381872
NO_x	27.625180
CO	89.003174

Pollutant	Emissions Per Year (TONs)
PM 10	1.434494
PM 2.5	1.332660
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.275205
N_2O	0.052409

Pollutant	Emissions Per Year (TONs)
CO_2	6900.927724
CO_2e	6922.521895

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	38.997144
SO_x	2.128536
NO_x	21.615735
CO	81.473289

Pollutant	Emissions Per Year (TONs)
PM 10	0.556229
PM 2.5	0.493374
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.254895
N_2O	0.048386

Pollutant	Emissions Per Year (TONs)
CO_2	6408.288005
CO_2e	6428.247241

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.290701
SO_x	0.072634
NO_x	0.985789
CO	6.446192

Pollutant	Emissions Per Year (TONs)
PM 10	0.143516
PM 2.5	0.128888
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009144
N_2O	0.001784

Pollutant	Emissions Per Year (TONs)
CO_2	217.456395
CO_2e	218.185164

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.656744
SO_x	0.180702
NO_x	5.023656
CO	1.083693

Pollutant	Emissions Per Year (TONs)
PM 10	0.734748
PM 2.5	0.710398
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011166
N_2O	0.002240

Pollutant	Emissions Per Year (TONs)
CO_2	275.183325
CO_2e	276.089490

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		7
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		5513
Number of Annual Trim Test(s) per Aircraft:		9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	17.16
Approach [Approach] (mins):	5.18
Climb Out [Intermediate] (mins):	0.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0.02

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36.4 Auxiliary Power Unit (APU)

36.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
1	0.25	No	4501687C	Hamilton Sundstrand

36.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
4501687C	211.0	0.010	0.230	1.380	1.070	-1.000	-1.000

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
4501687C	211.0	0.0	0.0	740.4	740.7

36.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

36.5 Aircraft Engine Test Cell

36.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 7

- Default Settings Used: No

- Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):	3
Idle Duration (mins):	0
Approach Duration (mins):	0
Intermediate Duration (mins):	12
Military Duration (mins):	8
After Burner Duration (mins):	7

36.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

36.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)

$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

36.6 Aerospace Ground Equipment (AGE)

36.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 5513

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

36.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

36.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Add T-7A CPs

- Activity Description:
In 2037, add 23,071 T-7A CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	5.641797
SO_x	3.155735
NO_x	51.032893
CO	9.059236

Pollutant	Emissions Per Year (TONs)
PM 10	0.358751
PM 2.5	0.307181
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.397269
N_2O	0.077507

Pollutant	Emissions Per Year (TONs)
CO_2	9447.857957
CO_2e	9479.520893

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	5.641797
SO_x	3.155735
NO_x	51.032893
CO	9.059236

Pollutant	Emissions Per Year (TONs)
PM 10	0.358751
PM 2.5	0.307181
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.397269
N_2O	0.077507

Pollutant	Emissions Per Year (TONs)
CO_2	9447.857957
CO_2e	9479.520893

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer

Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		7
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		23071
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38Cs and LTOs

- Activity Description:
By 2037, remove 47 T-38Cs and 3,142 LTOs, including flightline maintenance (trim test/trim pad runups) and engine test cell, and AGE.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-12.684719
SO_x	-1.373722
NO_x	-5.246094
CO	-141.434019

Pollutant	Emissions Per Year (TONs)
PM 10	-3.761470
PM 2.5	-3.411681
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.166334
N_2O	-0.032487

Pollutant	Emissions Per Year (TONs)
CO_2	-3961.247924
CO_2e	-3974.514235

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-11.647537
SO_x	-1.129948
NO_x	-1.790267
CO	-134.185236

Pollutant	Emissions Per Year (TONs)
PM 10	-3.255518
PM 2.5	-2.928119
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.142247
N_2O	-0.027752

Pollutant	Emissions Per Year (TONs)
CO_2	-3382.916471
CO_2e	-3394.253757

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.662888
SO_x	-0.140787
NO_x	-0.592717
CO	-6.631159

Pollutant	Emissions Per Year (TONs)
PM 10	-0.087200
PM 2.5	-0.078688
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.017723
N_2O	-0.003458

Pollutant	Emissions Per Year (TONs)
CO_2	-421.497423
CO_2e	-422.910002

- Activity Emissions of Criteria Pollutants [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.374295
SO_x	-0.102987
NO_x	-2.863110
CO	-0.617624

Pollutant	Emissions Per Year (TONs)
PM 10	-0.418752
PM 2.5	-0.404874
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006364
N_2O	-0.001276

Pollutant	Emissions Per Year (TONs)
CO_2	-156.834030
CO_2e	-157.350477

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 3142
Number of Annual Trim Test(s) per Aircraft: 9

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 18.56
Approach [Approach] (mins): 5.18
Climb Out [Intermediate] (mins): 0.99
Takeoff [Military] (mins): 0.37
Takeoff [After Burn] (mins): 0.33

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	10
Intermediate (mins):	7.5
Military (mins):	2
AfterBurn (mins):	0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38.4 Auxiliary Power Unit (APU)

38.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

38.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e

38.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

38.5 Aircraft Engine Test Cell

38.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
Total Number of Aircraft Engines Tested Annually: 94

- Default Settings Used: No

- Annual Run-ups / Test Durations
Annual Run-ups (Per Aircraft Engine): 2
Idle Duration (mins): 0
Approach Duration (mins): 0
Intermediate Duration (mins): 12
Military Duration (mins): 8
After Burner Duration (mins): 7

38.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

38.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
$TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000$

$TestCellPS_{POL}$: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year
$TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)
$TestCellPS_{IDLE}$: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs)
$TestCellPS_{APPROACH}$: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs)
$TestCellPS_{INTERMEDIATE}$: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs)
$TestCellPS_{MILITARY}$: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs)
$TestCellPS_{AFTERBURN}$: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

38.6 Aerospace Ground Equipment (AGE)

38.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 3142

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.5	No	Air Compressor	MC-1A - 18.4hp
1	0.17	No	Generator Set	A/M32A-86D
1	0.17	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-1-1
1	1	No	Light Cart	TF-1

38.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-1-1	2.5	0.026	0.018	0.757	0.043	0.109	0.105
TF-1	0.0	0.025	0.043	0.170	0.130	0.160	0.155

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-1-1	2.5	0.0	0.0	56.7	56.9
TF-1	0.0	0.0	0.0	33.0	33.1

38.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037 Remove T-38C CPs

- Activity Description:
By 2037, remove 13,151 T-38C CPs.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-2.757166
SO_x	-0.711742
NO_x	-0.701079
CO	-50.649832

Pollutant	Emissions Per Year (TONs)
PM 10	-1.232756
PM 2.5	-1.106142
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.089600
N_2O	-0.017481

Pollutant	Emissions Per Year (TONs)
CO_2	-2130.863488
CO_2e	-2138.004725

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.757166
SO_x	-0.711742
NO_x	-0.701079
CO	-50.649832

Pollutant	Emissions Per Year (TONs)
PM 10	-1.232756
PM 2.5	-1.106142
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.089600
N_2O	-0.017481

Pollutant	Emissions Per Year (TONs)
CO_2	-2130.863488
CO_2e	-2138.004725

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		13151
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.59
Climb Out [Intermediate] (mins):	1.15
Takeoff [Military] (mins):	0.34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

Sheppard AFB ROI: Alternative 3 GHG Report

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State: Texas
County(s): Wichita, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2031

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2031	2,707	0.10583419	0.03961577	2,720	68,039	No
2032	1,316	0.05015761	0.02649167	1,324	68,039	No
2033	391	0.01044379	0.00695799	393	68,039	No
2034	5,327	0.21147647	0.04562072	5,345	68,039	No
2035	16,373	0.65173527	0.12925664	16,426	68,039	No
2036	27,702	1.1027932	0.21490358	27,790	68,039	No
2037	36,836	1.47437851	0.28462429	36,952	68,039	No
2038 [SS Year]	36,836	1.47437851	0.28462429	36,952	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	700,652,689	3,554,625	135,896	836,194,567
2032	700,652,689	3,554,625	135,896	836,194,567
2033	700,652,689	3,554,625	135,896	836,194,567
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2031	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2032	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2033	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2031-2038	State Total	5,605,221,516	28,436,999	1,087,166	6,689,556,535
2031-2038	U.S. Total	41,091,633,432	205,015,293	12,005,661	50,013,561,837
2031-2038	Action	127,488	5.081198	1.032095	127,903
Percent of State Totals		0.00227444%	0.00001787%	0.00009493%	0.00191199%
Percent of U.S. Totals		0.00031025%	0.00000248%	0.00000860%	0.00025574%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00003427%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

SUA ROI

SUA ROI: Alternative 1 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, SUA Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
__X__ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving “steady state” (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action’s potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action’s net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.666	250	No
NOx	10.872	250	No
CO	-3.467	250	No
SOx	0.223	250	No
PM 10	-0.095	250	No
PM 2.5	-0.086	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.139	250	No
NOx	52.841	250	No
CO	-21.591	250	No
SOx	0.931	250	No
PM 10	-0.630	250	No
PM 2.5	-0.568	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.390	250	No
NOx	91.769	250	No
CO	-40.430	250	No
SOx	1.522	250	No
PM 10	-1.200	250	No
PM 2.5	-1.082	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.704	250	No
NOx	97.988	250	No
CO	-45.645	250	No
SOx	1.545	250	No
PM 10	-1.371	250	No
PM 2.5	-1.235	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.704	250	No
NOx	97.988	250	No
CO	-45.645	250	No
SOx	1.545	250	No
PM 10	-1.371	250	No
PM 2.5	-1.235	250	No
Pb	0.000	25	No
NH3	0.000	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Carolyn Hein, Contractor — May 12 2025

Name, Title — **Date**

SUA ROI: Alternative 1 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, SUA Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (IR-103)
3.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-158)
4.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-159)
5.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1142)
7.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
10.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (IR-103)
11.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-158)
12.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-159)
13.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1141)
14.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1142)
15.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1143)
16.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)
17.	Aircraft	2034: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
18.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (IR-103)
19.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-158)
20.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-159)
21.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1141)
22.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1142)
23.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1143)
24.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
25.	Aircraft	2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
26.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (IR-103)
27.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-158)
28.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-159)
29.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)
30.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)
31.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)
32.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

33.	Aircraft	2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
34.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (IR-103)
35.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-158)
36.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-159)
37.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1141)
38.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1142)
39.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1143)
40.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
41.	Aircraft	2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
42.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (IR-103)
43.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-158)
44.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-159)
45.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)
46.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)
47.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)
48.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
49.	Aircraft	2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
50.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (IR-103)
51.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-158)
52.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-159)
53.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1141)
54.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1142)
55.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1143)
56.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
57.	Aircraft	2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
58.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-158)
59.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-159)
60.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)
61.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)
62.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)
63.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)
64.	Aircraft	2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
65.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, add 3 T-7A Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.011483
SO_x	0.005413
NO_x	0.166931
CO	0.009510

Pollutant	Emissions Per Year (TONs)
PM 10	0.000809
PM 2.5	0.000708
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.011483
SO_x	0.005413
NO_x	0.166931
CO	0.009510

Pollutant	Emissions Per Year (TONs)
PM 10	0.000809
PM 2.5	0.000708
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, add 4 T-7A Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, add 51 T-7A Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.331853
SO_x	0.156424
NO_x	4.824291
CO	0.274838

Pollutant	Emissions Per Year (TONs)
PM 10	0.023391
PM 2.5	0.020467
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.331853
SO_x	0.156424
NO_x	4.824291
CO	0.274838

Pollutant	Emissions Per Year (TONs)
PM 10	0.023391
PM 2.5	0.020467
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 51
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, add 5 T-7A Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2034, add 6 T-7A Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		6
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2034, add 31 T-7A Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.243244
SO_x	0.114657
NO_x	3.536144
CO	0.201453

Pollutant	Emissions Per Year (TONs)
PM 10	0.017145
PM 2.5	0.015002
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.243244
SO_x	0.114657
NO_x	3.536144
CO	0.201453

Pollutant	Emissions Per Year (TONs)
PM 10	0.017145
PM 2.5	0.015002
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 31
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 10 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		10
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, add 101 T-7A Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.006440
SO_x	0.003582
NO_x	0.045751
CO	0.010157

Pollutant	Emissions Per Year (TONs)
PM 10	0.000386
PM 2.5	0.000327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000451
N_2O	0.000088

Pollutant	Emissions Per Year (TONs)
CO_2	10.725112
CO_2e	10.761056

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.006440
SO_x	0.003582
NO_x	0.045751
CO	0.010157

Pollutant	Emissions Per Year (TONs)
PM 10	0.000386
PM 2.5	0.000327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000451
N_2O	0.000088

Pollutant	Emissions Per Year (TONs)
CO_2	10.725112
CO_2e	10.761056

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		101
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, remove 3 T-38C Low-Altitude Operations in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.001665
SO_x	-0.002375
NO_x	-0.004262
CO	-0.068798

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002509
PM 2.5	-0.002242
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.001665
SO_x	-0.002375
NO_x	-0.004262
CO	-0.068798

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002509
PM 2.5	-0.002242
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, remove 4 T-38C Low-Altitude Operations in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003885
SO_x	-0.005543
NO_x	-0.009946
CO	-0.160528

Pollutant	Emissions Per Year (TONs)
PM 10	-0.005853
PM 2.5	-0.005232
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003885
SO_x	-0.005543
NO_x	-0.009946
CO	-0.160528

Pollutant	Emissions Per Year (TONs)
PM 10	-0.005853
PM 2.5	-0.005232
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, remove 45 T-38C Low-Altitude Operations in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042458
SO_x	-0.060573
NO_x	-0.108691
CO	-1.754344

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063969
PM 2.5	-0.057176
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042458
SO_x	-0.060573
NO_x	-0.108691
CO	-1.754344

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063969
PM 2.5	-0.057176
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		45
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, remove 4 T-38C Low-Altitude Operations in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003996
SO_x	-0.005701
NO_x	-0.010230
CO	-0.165115

Pollutant	Emissions Per Year (TONs)
PM 10	-0.006021
PM 2.5	-0.005381
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003996
SO_x	-0.005701
NO_x	-0.010230
CO	-0.165115

Pollutant	Emissions Per Year (TONs)
PM 10	-0.006021
PM 2.5	-0.005381
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2034, remove 5 T-38C Low-Altitude Operations in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004995
SO_x	-0.007126
NO_x	-0.012787
CO	-0.206393

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007526
PM 2.5	-0.006727
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004995
SO_x	-0.007126
NO_x	-0.012787
CO	-0.206393

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007526
PM 2.5	-0.006727
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:

In 2034, remove 27 T-38C Low-Altitude Operations in VR-1143 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.030719
SO_x	-0.043826
NO_x	-0.078641
CO	-1.269319

Pollutant	Emissions Per Year (TONs)
PM 10	-0.046284
PM 2.5	-0.041369
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.030719
SO_x	-0.043826
NO_x	-0.078641
CO	-1.269319

Pollutant	Emissions Per Year (TONs)
PM 10	-0.046284
PM 2.5	-0.041369
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2034, remove 9 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, remove 89 T-38C Low-Altitude Operations in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005080
SO_x	-0.001140
NO_x	-0.000803
CO	-0.091491

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002165
PM 2.5	-0.001945
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000144
N_2O	-0.000028

Pollutant	Emissions Per Year (TONs)
CO_2	-3.414146
CO_2e	-3.425588

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005080
SO_x	-0.001140
NO_x	-0.000803
CO	-0.091491

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002165
PM 2.5	-0.001945
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000144
N_2O	-0.000028

Pollutant	Emissions Per Year (TONs)
CO_2	-3.414146
CO_2e	-3.425588

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 89
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, add 13 T-7A Low-Altitude Operations in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, add 16 T-7A Low-Altitude Operations in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		16
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, add 196 T-7A Low-Altitude Operations in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.275356
SO_x	0.601159
NO_x	18.540414
CO	1.056242

Pollutant	Emissions Per Year (TONs)
PM 10	0.089893
PM 2.5	0.078656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.275356
SO_x	0.601159
NO_x	18.540414
CO	1.056242

Pollutant	Emissions Per Year (TONs)
PM 10	0.089893
PM 2.5	0.078656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 196
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, add 19 T-7A Low-Altitude Operations in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 19
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, add 24 T-7A Low-Altitude Operations in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.165352
SO_x	0.077941
NO_x	2.403799
CO	0.136944

Pollutant	Emissions Per Year (TONs)
PM 10	0.011655
PM 2.5	0.010198
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.165352
SO_x	0.077941
NO_x	2.403799
CO	0.136944

Pollutant	Emissions Per Year (TONs)
PM 10	0.011655
PM 2.5	0.010198
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		24
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, add 120 T-7A Low-Altitude Operations in VR-1143 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.941589
SO_x	0.443833
NO_x	13.688301
CO	0.779818

Pollutant	Emissions Per Year (TONs)
PM 10	0.066368
PM 2.5	0.058072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.941589
SO_x	0.443833
NO_x	13.688301
CO	0.779818

Pollutant	Emissions Per Year (TONs)
PM 10	0.066368
PM 2.5	0.058072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		120
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 40 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 40
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, add 389 T-7A Low-Altitude Operations in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.024804
SO_x	0.013797
NO_x	0.176211
CO	0.039118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001488
PM 2.5	0.001261
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001737
N_2O	0.000339

Pollutant	Emissions Per Year (TONs)
CO_2	41.307611
CO_2e	41.446046

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.024804
SO_x	0.013797
NO_x	0.176211
CO	0.039118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001488
PM 2.5	0.001261
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001737
N_2O	0.000339

Pollutant	Emissions Per Year (TONs)
CO_2	41.307611
CO_2e	41.446046

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 389
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, remove 14 T-38C Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.007770
SO_x	-0.011085
NO_x	-0.019891
CO	-0.321056

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011707
PM 2.5	-0.010464
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.007770
SO_x	-0.011085
NO_x	-0.019891
CO	-0.321056

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011707
PM 2.5	-0.010464
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 14
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, remove 18 T-38C Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, remove 224 T-38C Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.211344
SO_x	-0.301517
NO_x	-0.541041
CO	-8.732734

Pollutant	Emissions Per Year (TONs)
PM 10	-0.318425
PM 2.5	-0.284610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.211344
SO_x	-0.301517
NO_x	-0.541041
CO	-8.732734

Pollutant	Emissions Per Year (TONs)
PM 10	-0.318425
PM 2.5	-0.284610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 224
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, remove 21 T-38C Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.020979
SO_x	-0.029930
NO_x	-0.053706
CO	-0.866852

Pollutant	Emissions Per Year (TONs)
PM 10	-0.031608
PM 2.5	-0.028252
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003768
N_2O	-0.000735

Pollutant	Emissions Per Year (TONs)
CO_2	-89.606624
CO_2e	-89.906925

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.020979
SO_x	-0.029930
NO_x	-0.053706
CO	-0.866852

Pollutant	Emissions Per Year (TONs)
PM 10	-0.031608
PM 2.5	-0.028252
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003768
N_2O	-0.000735

Pollutant	Emissions Per Year (TONs)
CO_2	-89.606624
CO_2e	-89.906925

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 21
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, remove 27 T-38C Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		27
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, remove 137 T-38C Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.155872
SO_x	-0.222377
NO_x	-0.399032
CO	-6.440621

Pollutant	Emissions Per Year (TONs)
PM 10	-0.234847
PM 2.5	-0.209907
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.155872
SO_x	-0.222377
NO_x	-0.399032
CO	-6.440621

Pollutant	Emissions Per Year (TONs)
PM 10	-0.234847
PM 2.5	-0.209907
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		137
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, remove 45 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		45
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 444 T-38C Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025345
SO_x	-0.005689
NO_x	-0.004007
CO	-0.456427

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010802
PM 2.5	-0.009702
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000716
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.032370
CO_2e	-17.089451

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025345
SO_x	-0.005689
NO_x	-0.004007
CO	-0.456427

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010802
PM 2.5	-0.009702
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000716
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.032370
CO_2e	-17.089451

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		444
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, add 12 T-7A Low-Altitude Operations in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.045931
SO_x	0.021650
NO_x	0.667722
CO	0.038040

Pollutant	Emissions Per Year (TONs)
PM 10	0.003237
PM 2.5	0.002833
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002726
N_2O	0.000532

Pollutant	Emissions Per Year (TONs)
CO_2	64.818405
CO_2e	65.035633

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.045931
SO_x	0.021650
NO_x	0.667722
CO	0.038040

Pollutant	Emissions Per Year (TONs)
PM 10	0.003237
PM 2.5	0.002833
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002726
N_2O	0.000532

Pollutant	Emissions Per Year (TONs)
CO_2	64.818405
CO_2e	65.035633

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 12
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, add 14 T-7A Low-Altitude Operations in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.093776
SO_x	0.044203
NO_x	1.363266
CO	0.077665

Pollutant	Emissions Per Year (TONs)
PM 10	0.006610
PM 2.5	0.005784
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005565
N_2O	0.001086

Pollutant	Emissions Per Year (TONs)
CO_2	132.337577
CO_2e	132.781084

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.093776
SO_x	0.044203
NO_x	1.363266
CO	0.077665

Pollutant	Emissions Per Year (TONs)
PM 10	0.006610
PM 2.5	0.005784
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005565
N_2O	0.001086

Pollutant	Emissions Per Year (TONs)
CO_2	132.337577
CO_2e	132.781084

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		14
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, add 183 T-7A Low-Altitude Operations in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.190766
SO_x	0.561286
NO_x	17.310693
CO	0.986185

Pollutant	Emissions Per Year (TONs)
PM 10	0.083931
PM 2.5	0.073439
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070659
N_2O	0.013786

Pollutant	Emissions Per Year (TONs)
CO_2	1680.417149
CO_2e	1686.048789

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.190766
SO_x	0.561286
NO_x	17.310693
CO	0.986185

Pollutant	Emissions Per Year (TONs)
PM 10	0.083931
PM 2.5	0.073439
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070659
N_2O	0.013786

Pollutant	Emissions Per Year (TONs)
CO_2	1680.417149
CO_2e	1686.048789

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		183
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, add 17 T-7A Low-Altitude Operations in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.117125
SO_x	0.055208
NO_x	1.702691
CO	0.097002

Pollutant	Emissions Per Year (TONs)
PM 10	0.008255
PM 2.5	0.007224
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006950
N_2O	0.001356

Pollutant	Emissions Per Year (TONs)
CO_2	165.286933
CO_2e	165.840864

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.117125
SO_x	0.055208
NO_x	1.702691
CO	0.097002

Pollutant	Emissions Per Year (TONs)
PM 10	0.008255
PM 2.5	0.007224
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006950
N_2O	0.001356

Pollutant	Emissions Per Year (TONs)
CO_2	165.286933
CO_2e	165.840864

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 17
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, add 22 T-7A Low-Altitude Operations in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.151573
SO_x	0.071446
NO_x	2.203483
CO	0.125532

Pollutant	Emissions Per Year (TONs)
PM 10	0.010684
PM 2.5	0.009348
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.151573
SO_x	0.071446
NO_x	2.203483
CO	0.125532

Pollutant	Emissions Per Year (TONs)
PM 10	0.010684
PM 2.5	0.009348
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		22
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, add 113 T-7A Low-Altitude Operations in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.886663
SO_x	0.417943
NO_x	12.889817
CO	0.734329

Pollutant	Emissions Per Year (TONs)
PM 10	0.062496
PM 2.5	0.054684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.052614
N_2O	0.010265

Pollutant	Emissions Per Year (TONs)
CO_2	1251.265292
CO_2e	1255.458701

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.886663
SO_x	0.417943
NO_x	12.889817
CO	0.734329

Pollutant	Emissions Per Year (TONs)
PM 10	0.062496
PM 2.5	0.054684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.052614
N_2O	0.010265

Pollutant	Emissions Per Year (TONs)
CO_2	1251.265292
CO_2e	1255.458701

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		113
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 37 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.269080
SO_x	0.126835
NO_x	3.911738
CO	0.222851

Pollutant	Emissions Per Year (TONs)
PM 10	0.018966
PM 2.5	0.016595
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.015967
N_2O	0.003115

Pollutant	Emissions Per Year (TONs)
CO_2	379.727822
CO_2e	381.000417

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.269080
SO_x	0.126835
NO_x	3.911738
CO	0.222851

Pollutant	Emissions Per Year (TONs)
PM 10	0.018966
PM 2.5	0.016595
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.015967
N_2O	0.003115

Pollutant	Emissions Per Year (TONs)
CO_2	379.727822
CO_2e	381.000417

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 37
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, add 363 T-7A Low-Altitude Operations in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.023146
SO_x	0.012875
NO_x	0.164433
CO	0.036504

Pollutant	Emissions Per Year (TONs)
PM 10	0.001388
PM 2.5	0.001177
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001621
N_2O	0.000316

Pollutant	Emissions Per Year (TONs)
CO_2	38.546691
CO_2e	38.675874

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.023146
SO_x	0.012875
NO_x	0.164433
CO	0.036504

Pollutant	Emissions Per Year (TONs)
PM 10	0.001388
PM 2.5	0.001177
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001621
N_2O	0.000316

Pollutant	Emissions Per Year (TONs)
CO_2	38.546691
CO_2e	38.675874

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 363
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, remove 15 T-38C Low-Altitude Operations in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008325
SO_x	-0.011877
NO_x	-0.021312
CO	-0.343989

Pollutant	Emissions Per Year (TONs)
PM 10	-0.012543
PM 2.5	-0.011211
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008325
SO_x	-0.011877
NO_x	-0.021312
CO	-0.343989

Pollutant	Emissions Per Year (TONs)
PM 10	-0.012543
PM 2.5	-0.011211
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, remove 18 T-38C Low-Altitude Operations in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines

FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, remove 229 T-38C Low-Altitude Operations in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1

Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.216062
SO_x	-0.308248
NO_x	-0.553117
CO	-8.927661

Pollutant	Emissions Per Year (TONs)
PM 10	-0.325533
PM 2.5	-0.290963
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.216062
SO_x	-0.308248
NO_x	-0.553117
CO	-8.927661

Pollutant	Emissions Per Year (TONs)
PM 10	-0.325533
PM 2.5	-0.290963
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 229
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, remove 22 T-38C Low-Altitude Operations in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021978
SO_x	-0.031355
NO_x	-0.056264
CO	-0.908131

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033114
PM 2.5	-0.029597
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021978
SO_x	-0.031355
NO_x	-0.056264
CO	-0.908131

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033114
PM 2.5	-0.029597
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64

Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		22
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, remove 28 T-38C Low-Altitude Operations in VR-1142 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.027972
SO_x	-0.039907
NO_x	-0.071608
CO	-1.155803

Pollutant	Emissions Per Year (TONs)
PM 10	-0.042144
PM 2.5	-0.037669
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.027972
SO_x	-0.039907
NO_x	-0.071608
CO	-1.155803

Pollutant	Emissions Per Year (TONs)
PM 10	-0.042144
PM 2.5	-0.037669
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		28
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, remove 141 T-38C Low-Altitude Operations in VR-1143 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.160423
SO_x	-0.228870
NO_x	-0.410682
CO	-6.628668

Pollutant	Emissions Per Year (TONs)
PM 10	-0.241704
PM 2.5	-0.216036
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.160423
SO_x	-0.228870
NO_x	-0.410682
CO	-6.628668

Pollutant	Emissions Per Year (TONs)
PM 10	-0.241704
PM 2.5	-0.216036
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		141
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 46 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		46
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 454 T-38C Low-Altitude Operations in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025916
SO_x	-0.005817
NO_x	-0.004098
CO	-0.466707

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011045
PM 2.5	-0.009921
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000732
N_2O	-0.000143

Pollutant	Emissions Per Year (TONs)
CO_2	-17.415982
CO_2e	-17.474349

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025916
SO_x	-0.005817
NO_x	-0.004098
CO	-0.466707

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011045
PM 2.5	-0.009921
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000732
N_2O	-0.000143

Pollutant	Emissions Per Year (TONs)
CO_2	-17.415982
CO_2e	-17.474349

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		454
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, add 2 T-7A Low-Altitude Operations in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007655
SO_x	0.003608
NO_x	0.111287
CO	0.006340

Pollutant	Emissions Per Year (TONs)
PM 10	0.000540
PM 2.5	0.000472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.007655
SO_x	0.003608
NO_x	0.111287
CO	0.006340

Pollutant	Emissions Per Year (TONs)
PM 10	0.000540
PM 2.5	0.000472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, add 2 T-7A Low-Altitude Operations in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.013397
SO_x	0.006315
NO_x	0.194752
CO	0.011095

Pollutant	Emissions Per Year (TONs)
PM 10	0.000944
PM 2.5	0.000826
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000795
N_2O	0.000155

Pollutant	Emissions Per Year (TONs)
CO_2	18.905368
CO_2e	18.968726

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.013397
SO_x	0.006315
NO_x	0.194752
CO	0.011095

Pollutant	Emissions Per Year (TONs)
PM 10	0.000944
PM 2.5	0.000826
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000795
N_2O	0.000155

Pollutant	Emissions Per Year (TONs)
CO_2	18.905368
CO_2e	18.968726

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		2
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, add 30 T-7A Low-Altitude Operations in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.195208
SO_x	0.092014
NO_x	2.837819
CO	0.161670

Pollutant	Emissions Per Year (TONs)
PM 10	0.013759
PM 2.5	0.012039
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011583
N_2O	0.002260

Pollutant	Emissions Per Year (TONs)
CO_2	275.478221
CO_2e	276.401441

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.195208
SO_x	0.092014
NO_x	2.837819
CO	0.161670

Pollutant	Emissions Per Year (TONs)
PM 10	0.013759
PM 2.5	0.012039
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011583
N_2O	0.002260

Pollutant	Emissions Per Year (TONs)
CO_2	275.478221
CO_2e	276.401441

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		30
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, add 3 T-7A Low-Altitude Operations in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.020669
SO_x	0.009743
NO_x	0.300475
CO	0.017118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001457
PM 2.5	0.001275
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001226
N_2O	0.000239

Pollutant	Emissions Per Year (TONs)
CO_2	29.168282
CO_2e	29.266035

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.020669
SO_x	0.009743
NO_x	0.300475
CO	0.017118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001457
PM 2.5	0.001275
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001226
N_2O	0.000239

Pollutant	Emissions Per Year (TONs)
CO_2	29.168282
CO_2e	29.266035

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, add 4 T-7A Low-Altitude Operations in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.027559
SO_x	0.012990
NO_x	0.400633
CO	0.022824

Pollutant	Emissions Per Year (TONs)
PM 10	0.001942
PM 2.5	0.001700
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.027559
SO_x	0.012990
NO_x	0.400633
CO	0.022824

Pollutant	Emissions Per Year (TONs)
PM 10	0.001942
PM 2.5	0.001700
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, add 18 T-7A Low-Altitude Operations in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.141238
SO_x	0.066575
NO_x	2.053245
CO	0.116973

Pollutant	Emissions Per Year (TONs)
PM 10	0.009955
PM 2.5	0.008711
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008381
N_2O	0.001635

Pollutant	Emissions Per Year (TONs)
CO_2	199.316595
CO_2e	199.984572

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.141238
SO_x	0.066575
NO_x	2.053245
CO	0.116973

Pollutant	Emissions Per Year (TONs)
PM 10	0.009955
PM 2.5	0.008711
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008381
N_2O	0.001635

Pollutant	Emissions Per Year (TONs)
CO_2	199.316595
CO_2e	199.984572

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 6 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.043635
SO_x	0.020568
NO_x	0.634336
CO	0.036138

Pollutant	Emissions Per Year (TONs)
PM 10	0.003076
PM 2.5	0.002691
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002589
N_2O	0.000505

Pollutant	Emissions Per Year (TONs)
CO_2	61.577485
CO_2e	61.783851

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.043635
SO_x	0.020568
NO_x	0.634336
CO	0.036138

Pollutant	Emissions Per Year (TONs)
PM 10	0.003076
PM 2.5	0.002691
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002589
N_2O	0.000505

Pollutant	Emissions Per Year (TONs)
CO_2	61.577485
CO_2e	61.783851

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, add 59 T-7A Low-Altitude Operations in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.003762
SO_x	0.002093
NO_x	0.026726
CO	0.005933

Pollutant	Emissions Per Year (TONs)
PM 10	0.000226
PM 2.5	0.000191
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000263
N_2O	0.000051

Pollutant	Emissions Per Year (TONs)
CO_2	6.265165
CO_2e	6.286161

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.003762
SO_x	0.002093
NO_x	0.026726
CO	0.005933

Pollutant	Emissions Per Year (TONs)
PM 10	0.000226
PM 2.5	0.000191
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000263
N_2O	0.000051

Pollutant	Emissions Per Year (TONs)
CO_2	6.265165
CO_2e	6.286161

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 59
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, remove 5 T-38C Low-Altitude Operations in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004856
SO_x	-0.006928
NO_x	-0.012432
CO	-0.200660

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007317
PM 2.5	-0.006540
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004856
SO_x	-0.006928
NO_x	-0.012432
CO	-0.200660

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007317
PM 2.5	-0.006540
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, remove 61 T-38C Low-Altitude Operations in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.057554
SO_x	-0.082110
NO_x	-0.147337
CO	-2.378111

Pollutant	Emissions Per Year (TONs)
PM 10	-0.086714
PM 2.5	-0.077505
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.057554
SO_x	-0.082110
NO_x	-0.147337
CO	-2.378111

Pollutant	Emissions Per Year (TONs)
PM 10	-0.086714
PM 2.5	-0.077505
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 61
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, remove 6 T-38C Low-Altitude Operations in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005994
SO_x	-0.008551
NO_x	-0.015345
CO	-0.247672

Pollutant	Emissions Per Year (TONs)
PM 10	-0.009031
PM 2.5	-0.008072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005994
SO_x	-0.008551
NO_x	-0.015345
CO	-0.247672

Pollutant	Emissions Per Year (TONs)
PM 10	-0.009031
PM 2.5	-0.008072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, remove 7 T-38C Low-Altitude Operations in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, remove 37 T-38C Low-Altitude Operations in VR-1143 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042097
SO_x	-0.060058
NO_x	-0.107768
CO	-1.739438

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063426
PM 2.5	-0.056690
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042097
SO_x	-0.060058
NO_x	-0.107768
CO	-1.739438

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063426
PM 2.5	-0.056690
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 37
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, remove 12 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 12
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 120 T-38C Low-Altitude Operations in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006850
SO_x	-0.001538
NO_x	-0.001083
CO	-0.123359

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002919
PM 2.5	-0.002622
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000194
N_2O	-0.000038

Pollutant	Emissions Per Year (TONs)
CO_2	-4.603343
CO_2e	-4.618771

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006850
SO_x	-0.001538
NO_x	-0.001083
CO	-0.123359

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002919
PM 2.5	-0.002622
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000194
N_2O	-0.000038

Pollutant	Emissions Per Year (TONs)
CO_2	-4.603343
CO_2e	-4.618771

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 120
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, remove 4 T-38C Low-Altitude Operations in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes

End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002220
SO_x	-0.003167
NO_x	-0.005683
CO	-0.091730

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003345
PM 2.5	-0.002990
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002220
SO_x	-0.003167
NO_x	-0.005683
CO	-0.091730

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003345
PM 2.5	-0.002990
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: Alternative 1 GHG Report (Destination Cycles)

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, SUA Destination Cycle

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset

by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2034	4,748	0.19965167	0.03895209	4,764	68,039	No
2035	18,732	0.78766971	0.15367454	18,795	68,039	No
2036	32,130	1.35102373	0.26358503	32,238	68,039	No
2037	32,649	1.37286042	0.26784537	32,759	68,039	No
2038 [SS Year]	32,649	1.37286042	0.26784537	32,759	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2034-2038	State Total	3,503,263,447	17,773,124	679,479	4,180,972,834
2034-2038	U.S. Total	25,682,270,895	128,134,558	7,503,538	31,258,476,148
2034-2038	Action	120,909	5.084066	0.991902	121,315
Percent of State Totals		0.00345134%	0.00002861%	0.00014598%	0.00290159%
Percent of U.S. Totals		0.00047079%	0.00000397%	0.00001322%	0.00038810%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00005201%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

SUA ROI: Alternative 1 ACAM Detail Report (Destination Cycles)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, SUA Destination Cycle

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Destination Cycles (IR-103)
3.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-158)
4.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-159)
5.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Destination Cycles(VR-1142)
7.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1146)
9.	Aircraft	2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
10.	Aircraft	2034: Add T-7A MOA Destination Cycles (Hollis MOA)
11.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)
12.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)
13.	Aircraft	2034: Add T-7A MOA Destination Cycles (Washita MOA)
14.	Aircraft	2034: Remove T-38C MTR Destination Cycles (IR-103)
15.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-158)
16.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-159)
17.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1141)
18.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1142)
19.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1143)
20.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1146)
21.	Aircraft	2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
22.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Hollis MOA)
23.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
24.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
25.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Washita MOA)
26.	Aircraft	2035: Add T-7A MTR Destination Cycles (IR-103)
27.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-158)
28.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-159)
29.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1141)
30.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1142)
31.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1143)
32.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1146)
33.	Aircraft	2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

34.	Aircraft	2035: Add T-7A MOA Destination Cycles (Hollis MOA)
35.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)
36.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 2MOA)
37.	Aircraft	2035: Add T-7A MOA Destination Cycles (Washita MOA)
38.	Aircraft	2035: Remove T-38C MTR Destination Cycles (IR-103)
39.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-158)
40.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-159)
41.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1141)
42.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1142)
43.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1143)
44.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1146)
45.	Aircraft	2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
46.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Hollis MOA)
47.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
48.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
49.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Washita MOA)
50.	Aircraft	2036: Add T-7A MTR Destination Cycles (IR-103)
51.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-158)
52.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-159)
53.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1141)
54.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1142)
55.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1143)
56.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1146)
57.	Aircraft	2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
58.	Aircraft	2036: Add T-7A MOA Destination Cycles (Hollis MOA)
59.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)
60.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)
61.	Aircraft	2036: Add T-7A MOA Destination Cycles (Washita MOA)
62.	Aircraft	2036: Remove T-38C MTR Destination Cycles (IR-103)
63.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-158)
64.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-159)
65.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1141)
66.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1142)
67.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1143)
68.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1146)
69.	Aircraft	2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
70.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Hollis MOA)
71.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
72.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
73.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Washita MOA)
74.	Aircraft	2037: Add T-7A MTR Destination Cycles (IR-103)
75.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-158)
76.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-159)
77.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1141)
78.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1142)
79.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1143)
80.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1146)
81.	Aircraft	2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
82.	Aircraft	2037: Add T-7A MOA Destination Cycles (Hollis MOA)
83.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)
84.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)
85.	Aircraft	2037: Add T-7A MOA Destination Cycles (Washita MOA)
86.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-158)
87.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-159)
88.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1141)
89.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1142)

90.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1143)
91.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1146)
92.	Aircraft	2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
93.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Hollis MOA)
94.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
95.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
96.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Washita MOA)
97.	Aircraft	2037: Remove T-38C MTR Destination Cycles (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, add 3 T-7A Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, add 4 T-7A Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, add 51 T-7A Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		51
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, add 5 T-7A Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles(VR-1142)

- Activity Description:
In 2034, add 6 T-7A Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		6
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2034, add 31 T-7A Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		31
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2034, add 11 T-7A Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004747
N_2O	0.000926

Pollutant	Emissions Per Year (TONs)
CO_2	112.892055
CO_2e	113.270394

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004747
N_2O	0.000926

Pollutant	Emissions Per Year (TONs)
CO_2	112.892055
CO_2e	113.270394

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 11
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, add 252 T-7A Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001125
N_2O	0.000220

Pollutant	Emissions Per Year (TONs)
CO_2	26.759686
CO_2e	26.849367

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001125
N_2O	0.000220

Pollutant	Emissions Per Year (TONs)
CO_2	26.759686
CO_2e	26.849367

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 252
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, add 17 T-7A Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002662
N_2O	0.000519

Pollutant	Emissions Per Year (TONs)
CO_2	63.299814
CO_2e	63.511953

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002662
N_2O	0.000519

Pollutant	Emissions Per Year (TONs)
CO_2	63.299814
CO_2e	63.511953

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102

Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		17
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines

FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, add 929 T-7A Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.174543
N_2O	0.034053

Pollutant	Emissions Per Year (TONs)
CO_2	4150.978406
CO_2e	4164.889724

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.174543
N_2O	0.034053

Pollutant	Emissions Per Year (TONs)
CO_2	4150.978406
CO_2e	4164.889724

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		929
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, add 237 T-7A Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.046024
N_2O	0.008979

Pollutant	Emissions Per Year (TONs)
CO_2	1094.534097
CO_2e	1098.202247

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.046024
N_2O	0.008979

Pollutant	Emissions Per Year (TONs)
CO_2	1094.534097
CO_2e	1098.202247

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 237
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, add 467 T-7A Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085977
N_2O	0.016774

Pollutant	Emissions Per Year (TONs)
CO_2	2044.698023
CO_2e	2051.550491

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085977
N_2O	0.016774

Pollutant	Emissions Per Year (TONs)
CO_2	2044.698023
CO_2e	2051.550491

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		467
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, remove 3 T-38C Destination Cycles in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, remove 4 T-38C Destination Cycles in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17

Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, remove 45 T-38C Destination Cycles in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, remove 4 T-38C Destination Cycles in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2034, remove 5 T-38C Destination Cycles in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:
In 2034, remove 27 T-38C Destination Cycles in VR-1143 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		27
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2034, remove 10 T-38C Destination Cycles in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001894
N_2O	-0.000369

Pollutant	Emissions Per Year (TONs)
CO_2	-45.040366
CO_2e	-45.191312

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001894
N_2O	-0.000369

Pollutant	Emissions Per Year (TONs)
CO_2	-45.040366
CO_2e	-45.191312

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		10
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, remove 220 T-38C Destination Cycles in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000355
N_2O	-0.000069

Pollutant	Emissions Per Year (TONs)
CO_2	-8.439463
CO_2e	-8.467746

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000355
N_2O	-0.000069

Pollutant	Emissions Per Year (TONs)
CO_2	-8.439463
CO_2e	-8.467746

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		220
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, remove 15 T-38C Destination Cycles in Hollis MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001057
N_2O	-0.000206

Pollutant	Emissions Per Year (TONs)
CO_2	-25.139396
CO_2e	-25.223646

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001057
N_2O	-0.000206

Pollutant	Emissions Per Year (TONs)
CO_2	-25.139396
CO_2e	-25.223646

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		15
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, remove 813 T-38C Destination Cycles in Westover 1 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.068752
N_2O	-0.013414

Pollutant	Emissions Per Year (TONs)
CO_2	-1635.066305
CO_2e	-1640.545959

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.068752
N_2O	-0.013414

Pollutant	Emissions Per Year (TONs)
CO_2	-1635.066305
CO_2e	-1640.545959

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		813
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, remove 208 T-38C Destination Cycles in Westover 2 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.018590
N_2O	-0.003627

Pollutant	Emissions Per Year (TONs)
CO_2	-442.107011
CO_2e	-443.588659

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.018590
N_2O	-0.003627

Pollutant	Emissions Per Year (TONs)
CO_2	-442.107011
CO_2e	-443.588659

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 208
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, remove 409 T-38C Destination Cycles in Washita MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.029490
N_2O	-0.005754

Pollutant	Emissions Per Year (TONs)
CO_2	-701.342867
CO_2e	-703.693302

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.029490
N_2O	-0.005754

Pollutant	Emissions Per Year (TONs)
CO_2	-701.342867
CO_2e	-703.693302

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 409
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, add 13 T-7A Destination Cycles in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, add 17 T-7A Destination Cycles in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006757
N_2O	0.001318

Pollutant	Emissions Per Year (TONs)
CO_2	160.695629
CO_2e	161.234174

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006757
N_2O	0.001318

Pollutant	Emissions Per Year (TONs)
CO_2	160.695629
CO_2e	161.234174

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		17
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, add 196 T-7A Destination Cycles in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 196
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, add 19 T-7A Destination Cycles in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 19
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2035, add 24 T-7A Destination Cycles in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		24
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2035, add 120 T-7A Destination Cycles in VR-1143 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		120
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2035, add 43 T-7A Destination Cycles in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018556
N_2O	0.003620

Pollutant	Emissions Per Year (TONs)
CO_2	441.305307
CO_2e	442.784269

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018556
N_2O	0.003620

Pollutant	Emissions Per Year (TONs)
CO_2	441.305307
CO_2e	442.784269

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 43
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, add 965 T-7A Destination Cycles in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004309
N_2O	0.000841

Pollutant	Emissions Per Year (TONs)
CO_2	102.472608
CO_2e	102.816028

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004309
N_2O	0.000841

Pollutant	Emissions Per Year (TONs)
CO_2	102.472608
CO_2e	102.816028

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 965
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, add 65 T-7A Destination Cycles in Hollis MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010177
N_2O	0.001986

Pollutant	Emissions Per Year (TONs)
CO_2	242.028701
CO_2e	242.839821

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010177
N_2O	0.001986

Pollutant	Emissions Per Year (TONs)
CO_2	242.028701
CO_2e	242.839821

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		65
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, add 3,560 T-7A Destination Cycles in Westover 1 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.668861
N_2O	0.130495

Pollutant	Emissions Per Year (TONs)
CO_2	15906.870964
CO_2e	15960.180214

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.668861
N_2O	0.130495

Pollutant	Emissions Per Year (TONs)
CO_2	15906.870964
CO_2e	15960.180214

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3560
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 2MOA)

- Activity Description:
In 2035, add 909 T-7A Destination Cycles in Westover 2 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.176521
N_2O	0.034439

Pollutant	Emissions Per Year (TONs)
CO_2	4198.023181
CO_2e	4212.092162

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.176521
N_2O	0.034439

Pollutant	Emissions Per Year (TONs)
CO_2	4198.023181
CO_2e	4212.092162

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 909
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, add 1,790 T-7A Destination Cycles in Washita MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.329546
N_2O	0.064295

Pollutant	Emissions Per Year (TONs)
CO_2	7837.279361
CO_2e	7863.544709

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.329546
N_2O	0.064295

Pollutant	Emissions Per Year (TONs)
CO_2	7837.279361
CO_2e	7863.544709

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1790
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, remove 14 T-38C Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		14
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, remove 19 T-38C Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003314
N_2O	-0.000647

Pollutant	Emissions Per Year (TONs)
CO_2	-78.820641
CO_2e	-79.084796

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003314
N_2O	-0.000647

Pollutant	Emissions Per Year (TONs)
CO_2	-78.820641
CO_2e	-79.084796

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		19
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, remove 224 T-38C Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 224
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, remove 22 T-38C Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:

In 2035, remove 27 T-38C Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2035, remove 137 T-38C Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 137
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2035, remove 49 T-38C Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009280
N_2O	-0.001811

Pollutant	Emissions Per Year (TONs)
CO_2	-220.697795
CO_2e	-221.437428

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009280
N_2O	-0.001811

Pollutant	Emissions Per Year (TONs)
CO_2	-220.697795
CO_2e	-221.437428

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 49
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 1,102 T-38C Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001778
N_2O	-0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	-42.274036
CO_2e	-42.415710

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001778
N_2O	-0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	-42.274036
CO_2e	-42.415710

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1102
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, remove 74 T-38C Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005215
N_2O	-0.001017

Pollutant	Emissions Per Year (TONs)
CO_2	-124.021019
CO_2e	-124.436655

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005215
N_2O	-0.001017

Pollutant	Emissions Per Year (TONs)
CO_2	-124.021019
CO_2e	-124.436655

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 74
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, remove 4,063 T-38C Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.343592
N_2O	-0.067035

Pollutant	Emissions Per Year (TONs)
CO_2	-8171.309221
CO_2e	-8198.694014

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.343592
N_2O	-0.067035

Pollutant	Emissions Per Year (TONs)
CO_2	-8171.309221
CO_2e	-8198.694014

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4063
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2035, remove 1,477 T-38C Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.132007
N_2O	-0.025755

Pollutant	Emissions Per Year (TONs)
CO_2	-3139.384879
CO_2e	-3149.906009

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.132007
N_2O	-0.025755

Pollutant	Emissions Per Year (TONs)
CO_2	-3139.384879
CO_2e	-3149.906009

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1477
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, remove 2,043 T-38C Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.147308
N_2O	-0.028740

Pollutant	Emissions Per Year (TONs)
CO_2	-3503.284787
CO_2e	-3515.025467

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.147308
N_2O	-0.028740

Pollutant	Emissions Per Year (TONs)
CO_2	-3503.284787
CO_2e	-3515.025467

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2043
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, add 12 T-7A Destination Cycles in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002726
N_2O	0.000532

Pollutant	Emissions Per Year (TONs)
CO_2	64.818405
CO_2e	65.035633

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002726
N_2O	0.000532

Pollutant	Emissions Per Year (TONs)
CO_2	64.818405
CO_2e	65.035633

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		12
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, add 16 T-7A Destination Cycles in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 16
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, add 183 T-7A Destination Cycles in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070659
N_2O	0.013786

Pollutant	Emissions Per Year (TONs)
CO_2	1680.417149
CO_2e	1686.048789

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070659
N_2O	0.013786

Pollutant	Emissions Per Year (TONs)
CO_2	1680.417149
CO_2e	1686.048789

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		183
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, add 18 T-7A Destination Cycles in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007359
N_2O	0.001436

Pollutant	Emissions Per Year (TONs)
CO_2	175.009693
CO_2e	175.596209

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007359
N_2O	0.001436

Pollutant	Emissions Per Year (TONs)
CO_2	175.009693
CO_2e	175.596209

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2036, add 22 T-7A Destination Cycles in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:

In 2036, add 113 T-7A Destination Cycles in VR-1143 with 108 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.052614
N_2O	0.010265

Pollutant	Emissions Per Year (TONs)
CO_2	1251.265292
CO_2e	1255.458701

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.052614
N_2O	0.010265

Pollutant	Emissions Per Year (TONs)
CO_2	1251.265292
CO_2e	1255.458701

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 113
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2036, add 40 T-7A Destination Cycles in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		40
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, add 902 T-7A Destination Cycles in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004028
N_2O	0.000786

Pollutant	Emissions Per Year (TONs)
CO_2	95.782686
CO_2e	96.103686

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004028
N_2O	0.000786

Pollutant	Emissions Per Year (TONs)
CO_2	95.782686
CO_2e	96.103686

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		902
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, add 60 T-7A Destination Cycles in Hollis MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009394
N_2O	0.001833

Pollutant	Emissions Per Year (TONs)
CO_2	223.411109
CO_2e	224.159834

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009394
N_2O	0.001833

Pollutant	Emissions Per Year (TONs)
CO_2	223.411109
CO_2e	224.159834

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 60
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, add 3,327 T-7A Destination Cycles in Westover 1 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.625084
N_2O	0.121954

Pollutant	Emissions Per Year (TONs)
CO_2	14865.775196
CO_2e	14915.595385

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.625084
N_2O	0.121954

Pollutant	Emissions Per Year (TONs)
CO_2	14865.775196
CO_2e	14915.595385

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		3327
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, add 850 T-7A Destination Cycles in Westover 2 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.165063
N_2O	0.032204

Pollutant	Emissions Per Year (TONs)
CO_2	3925.544228
CO_2e	3938.700042

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.165063
N_2O	0.032204

Pollutant	Emissions Per Year (TONs)
CO_2	3925.544228
CO_2e	3938.700042

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		850
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, add 1,673 T-7A Destination Cycles in Washita MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.308006
N_2O	0.060092

Pollutant	Emissions Per Year (TONs)
CO_2	7325.010263
CO_2e	7349.558825

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.308006
N_2O	0.060092

Pollutant	Emissions Per Year (TONs)
CO_2	7325.010263
CO_2e	7349.558825

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1673
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, remove 15 T-38C Destination Cycles in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, remove 20 T-38C Destination Cycles in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003489
N_2O	-0.000681

Pollutant	Emissions Per Year (TONs)
CO_2	-82.969096
CO_2e	-83.247153

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003489
N_2O	-0.000681

Pollutant	Emissions Per Year (TONs)
CO_2	-82.969096
CO_2e	-83.247153

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 20
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, remove 229 T-38C Destination Cycles in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 229
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0

Military (mins): 0
AfterBurn (mins): 0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, remove 23 T-38C Destination Cycles in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004127
N_2O	-0.000805

Pollutant	Emissions Per Year (TONs)
CO_2	-98.140588
CO_2e	-98.469490

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004127
N_2O	-0.000805

Pollutant	Emissions Per Year (TONs)
CO_2	-98.140588
CO_2e	-98.469490

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

66. Aircraft

66.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2036, remove 28 T-38C Destination Cycles in VR-1142 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

66.2 Aircraft & Engines

66.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

66.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

66.3 Flight Operations

66.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 28
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

66.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

67. Aircraft

67.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo

Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2036, remove 141 T-38C Destination Cycles in VR-1143 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

67.2 Aircraft & Engines

67.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

67.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

67.3 Flight Operations

67.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 141
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

67.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

68. Aircraft

68.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2036, remove 50 T-38C Destination Cycles in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009469
N_2O	-0.001847

Pollutant	Emissions Per Year (TONs)
CO_2	-225.201832
CO_2e	-225.956559

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009469
N_2O	-0.001847

Pollutant	Emissions Per Year (TONs)
CO_2	-225.201832
CO_2e	-225.956559

68.2 Aircraft & Engines

68.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

68.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

68.3 Flight Operations

68.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 50
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

68.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

69. Aircraft

69.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 1,128 T-38C Destination Cycles in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001820
N_2O	-0.000355

Pollutant	Emissions Per Year (TONs)
CO_2	-43.271427
CO_2e	-43.416444

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001820
N_2O	-0.000355

Pollutant	Emissions Per Year (TONs)
CO_2	-43.271427
CO_2e	-43.416444

69.2 Aircraft & Engines

69.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

69.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

69.3 Flight Operations

69.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1128
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

69.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

70. Aircraft

70.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, remove 75 T-38C Destination Cycles in Hollis MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005285
N_2O	-0.001031

Pollutant	Emissions Per Year (TONs)
CO_2	-125.696979
CO_2e	-126.118232

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005285
N_2O	-0.001031

Pollutant	Emissions Per Year (TONs)
CO_2	-125.696979
CO_2e	-126.118232

70.2 Aircraft & Engines

70.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

70.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

70.3 Flight Operations

70.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		75
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

70.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

71. Aircraft

71.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, remove 4,159 T-38C Destination Cycles in Westover 1 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.351710
N_2O	-0.068619

Pollutant	Emissions Per Year (TONs)
CO_2	-8364.379781
CO_2e	-8392.411618

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.351710
N_2O	-0.068619

Pollutant	Emissions Per Year (TONs)
CO_2	-8364.379781
CO_2e	-8392.411618

71.2 Aircraft & Engines

71.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

71.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

71.3 Flight Operations

71.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4159
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

71.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

72. Aircraft

72.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, remove 623 T-38C Destination Cycles in Westover 2 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.055680
N_2O	-0.010863

Pollutant	Emissions Per Year (TONs)
CO_2	-1324.195518
CO_2e	-1328.633340

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.055680
N_2O	-0.010863

Pollutant	Emissions Per Year (TONs)
CO_2	-1324.195518
CO_2e	-1328.633340

72.2 Aircraft & Engines

72.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

72.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

72.3 Flight Operations

72.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		623
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

72.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

73. Aircraft

73.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, remove 2,092 T-38C Destination Cycles in Washita MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.150841
N_2O	-0.029429

Pollutant	Emissions Per Year (TONs)
CO_2	-3587.308749
CO_2e	-3599.331022

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.150841
N_2O	-0.029429

Pollutant	Emissions Per Year (TONs)
CO_2	-3587.308749
CO_2e	-3599.331022

73.2 Aircraft & Engines

73.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

73.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

73.3 Flight Operations

73.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		2092
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

73.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

74. Aircraft

74.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, add 2 T-7A Destination Cycles in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

74.2 Aircraft & Engines

74.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

74.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

74.3 Flight Operations

74.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

74.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

75. Aircraft

75.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, add 3 T-7A Destination Cycles in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

75.2 Aircraft & Engines

75.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

75.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

75.3 Flight Operations

75.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

75.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

76. Aircraft

76.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, add 30 T-7A Destination Cycles in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011583
N_2O	0.002260

Pollutant	Emissions Per Year (TONs)
CO_2	275.478221
CO_2e	276.401441

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011583
N_2O	0.002260

Pollutant	Emissions Per Year (TONs)
CO_2	275.478221
CO_2e	276.401441

76.2 Aircraft & Engines

76.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

76.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

76.3 Flight Operations

76.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		30
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

76.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

77. Aircraft

77.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, add 3 T-7A Destination Cycles in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001226
N_2O	0.000239

Pollutant	Emissions Per Year (TONs)
CO_2	29.168282
CO_2e	29.266035

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001226
N_2O	0.000239

Pollutant	Emissions Per Year (TONs)
CO_2	29.168282
CO_2e	29.266035

77.2 Aircraft & Engines

77.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

77.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

77.3 Flight Operations

77.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

77.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

78. Aircraft

78.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, add 4 T-7A Destination Cycles in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

78.2 Aircraft & Engines

78.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

78.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

78.3 Flight Operations

78.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

78.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

79. Aircraft

79.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2037, add 18 T-7A Destination Cycles in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008381
N_2O	0.001635

Pollutant	Emissions Per Year (TONs)
CO_2	199.316595
CO_2e	199.984572

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008381
N_2O	0.001635

Pollutant	Emissions Per Year (TONs)
CO_2	199.316595
CO_2e	199.984572

79.2 Aircraft & Engines

79.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

79.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

79.3 Flight Operations

79.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

79.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

80. Aircraft

80.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2037, add 7 T-7A Destination Cycles in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003021
N_2O	0.000589

Pollutant	Emissions Per Year (TONs)
CO_2	71.840399
CO_2e	72.081160

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003021
N_2O	0.000589

Pollutant	Emissions Per Year (TONs)
CO_2	71.840399
CO_2e	72.081160

80.2 Aircraft & Engines

80.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

80.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

80.3 Flight Operations

80.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		7
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

80.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

81. Aircraft

81.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, add 59 T-7A Destination Cycles in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000656
N_2O	0.000128

Pollutant	Emissions Per Year (TONs)
CO_2	15.609817
CO_2e	15.662131

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000656
N_2O	0.000128

Pollutant	Emissions Per Year (TONs)
CO_2	15.609817
CO_2e	15.662131

81.2 Aircraft & Engines

81.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

81.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

81.3 Flight Operations

81.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 147
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

81.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

82. Aircraft

82.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, add 10 T-7A Destination Cycles in Hollis MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001566
N_2O	0.000305

Pollutant	Emissions Per Year (TONs)
CO_2	37.235185
CO_2e	37.359972

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001566
N_2O	0.000305

Pollutant	Emissions Per Year (TONs)
CO_2	37.235185
CO_2e	37.359972

82.2 Aircraft & Engines

82.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

82.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

82.3 Flight Operations

82.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

82.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

83. Aircraft

83.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, add 542 T-7A Destination Cycles in Westover 1 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.101832
N_2O	0.019867

Pollutant	Emissions Per Year (TONs)
CO_2	2421.776422
CO_2e	2429.892606

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.101832
N_2O	0.019867

Pollutant	Emissions Per Year (TONs)
CO_2	2421.776422
CO_2e	2429.892606

83.2 Aircraft & Engines

83.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

83.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

83.3 Flight Operations

83.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		542
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

83.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

84. Aircraft

84.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, add 138 T-7A Destination Cycles in Westover 2 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes

End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.026799
N_2O	0.005228

Pollutant	Emissions Per Year (TONs)
CO_2	637.323651
CO_2e	639.459536

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.026799
N_2O	0.005228

Pollutant	Emissions Per Year (TONs)
CO_2	637.323651
CO_2e	639.459536

84.2 Aircraft & Engines

84.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

84.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

84.3 Flight Operations

84.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)

Number of Annual Flight Operation Cycles for all Aircraft: 138
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

84.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

85. Aircraft

85.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, add 272 T-7A Destination Cycles in Washita MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.050076
N_2O	0.009770

Pollutant	Emissions Per Year (TONs)
CO_2	1190.916193
CO_2e	1194.907352

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.050076
N_2O	0.009770

Pollutant	Emissions Per Year (TONs)
CO_2	1190.916193
CO_2e	1194.907352

85.2 Aircraft & Engines

85.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

85.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

85.3 Flight Operations

85.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 272
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

85.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

86. Aircraft

86.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, remove 5 T-38C Destination Cycles in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

86.2 Aircraft & Engines

86.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

86.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

86.3 Flight Operations

86.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

86.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

87. Aircraft

87.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, remove 61 T-38C Destination Cycles in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

87.2 Aircraft & Engines

87.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

87.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

87.3 Flight Operations

87.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 61
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

87.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

88. Aircraft

88.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, remove 6 T-38C Destination Cycles in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

88.2 Aircraft & Engines

88.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

88.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

88.3 Flight Operations

88.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

88.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

89. Aircraft

89.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, remove 7 T-38C Destination Cycles in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

89.2 Aircraft & Engines

89.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

89.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

89.3 Flight Operations

89.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

89.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

90. Aircraft

90.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:
In 2037, remove 37 T-38C Destination Cycles in VR-1143 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

90.2 Aircraft & Engines

90.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

90.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

90.3 Flight Operations

90.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 37
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

90.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

91. Aircraft

91.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2037, remove 13 T-38C Destination Cycles in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002462
N_2O	-0.000480

Pollutant	Emissions Per Year (TONs)
CO_2	-58.552476
CO_2e	-58.748705

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002462
N_2O	-0.000480

Pollutant	Emissions Per Year (TONs)
CO_2	-58.552476
CO_2e	-58.748705

91.2 Aircraft & Engines

91.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

91.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

91.3 Flight Operations

91.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 13
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

91.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

92. Aircraft

92.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 299 T-38C Destination Cycles in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A

End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000482
N_2O	-0.000094

Pollutant	Emissions Per Year (TONs)
CO_2	-11.469997
CO_2e	-11.508437

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000482
N_2O	-0.000094

Pollutant	Emissions Per Year (TONs)
CO_2	-11.469997
CO_2e	-11.508437

92.2 Aircraft & Engines

92.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

92.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64

Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

92.3 Flight Operations

92.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 299
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

92.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

93. Aircraft

93.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, remove 20 T-38C Destination Cycles in Hollis MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001409
N_2O	-0.000275

Pollutant	Emissions Per Year (TONs)
CO_2	-33.519194
CO_2e	-33.631528

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001409
N_2O	-0.000275

Pollutant	Emissions Per Year (TONs)
CO_2	-33.519194
CO_2e	-33.631528

93.2 Aircraft & Engines

93.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

93.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

93.3 Flight Operations

93.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		20
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

93.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

94. Aircraft

94.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, remove 1,103 T-38C Destination Cycles in Westover 1 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.093276
N_2O	-0.018198

Pollutant	Emissions Per Year (TONs)
CO_2	-2218.300288
CO_2e	-2225.734555

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.093276
N_2O	-0.018198

Pollutant	Emissions Per Year (TONs)
CO_2	-2218.300288
CO_2e	-2225.734555

94.2 Aircraft & Engines

94.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

94.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

94.3 Flight Operations

94.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1103
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

94.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

95. Aircraft

95.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, remove 282 T-38C Destination Cycles in Westover 2 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.025204
N_2O	-0.004917

Pollutant	Emissions Per Year (TONs)
CO_2	-599.395082
CO_2e	-601.403855

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.025204
N_2O	-0.004917

Pollutant	Emissions Per Year (TONs)
CO_2	-599.395082
CO_2e	-601.403855

95.2 Aircraft & Engines

95.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

95.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

95.3 Flight Operations

95.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		282
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

95.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

96. Aircraft

96.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, remove 555 T-38C Destination Cycles in Washita MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.040018
N_2O	-0.007807

Pollutant	Emissions Per Year (TONs)
CO_2	-951.699979
CO_2e	-954.889444

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.040018
N_2O	-0.007807

Pollutant	Emissions Per Year (TONs)
CO_2	-951.699979
CO_2e	-954.889444

96.2 Aircraft & Engines

96.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

96.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

96.3 Flight Operations

96.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 555
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

96.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

97. Aircraft

97.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, remove 4 T-38C Destination Cycles in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

97.2 Aircraft & Engines

97.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

97.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

97.3 Flight Operations

97.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

97.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: Alternative 2 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, SUA Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-

site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
__X__ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.163	250	No
NOx	14.516	250	No
CO	8.532	250	No
SOx	0.721	250	No
PM 10	0.348	250	No
PM 2.5	0.310	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.247	250	No
NOx	66.901	250	No
CO	-14.185	250	No
SOx	1.601	250	No
PM 10	-0.324	250	No
PM 2.5	-0.296	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.071	250	No
NOx	115.702	250	No
CO	-37.749	250	No
SOx	2.344	250	No
PM 10	-1.037	250	No
PM 2.5	-0.938	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.470	250	No
NOx	123.584	250	No
CO	-44.266	250	No
SOx	2.377	250	No
PM 10	-1.250	250	No
PM 2.5	-1.129	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.470	250	No
NOx	123.584	250	No
CO	-44.266	250	No
SOx	2.377	250	No
PM 10	-1.250	250	No
PM 2.5	-1.129	250	No
Pb	0.000	25	No
NH3	0.000	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Carolyn Hein, Contractor	May 12 2025
Name, Title	**Date**

SUA ROI: Alternative 2 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, SUA Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (IR-103)
3.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-158)
4.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-159)
5.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1142)
7.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
10.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (IR-103)
11.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-158)
12.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-159)
13.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-1141)
14.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-1142)
15.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-1143)
16.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-1146)
17.	Aircraft	2034: Add T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
18.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (IR-103)
19.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-158)
20.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-159)
21.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1141)
22.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1142)
23.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1143)
24.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
25.	Aircraft	2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
26.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (IR-103)
27.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-158)
28.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-159)
29.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)
30.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)
31.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)
32.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)
33.	Aircraft	2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

34.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (IR-103)
35.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-158)
36.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-159)
37.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1141)
38.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1142)
39.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1143)
40.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
41.	Aircraft	2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
42.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (IR-103)
43.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-158)
44.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-159)
45.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)
46.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)
47.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)
48.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
49.	Aircraft	2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
50.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (IR-103)
51.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-158)
52.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-159)
53.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1141)
54.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1142)
55.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1143)
56.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
57.	Aircraft	2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
58.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-158)
59.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-159)
60.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)
61.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)
62.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)
63.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)
64.	Aircraft	2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
65.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, add 4 T-7A Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.015310
SO_x	0.007217
NO_x	0.222574
CO	0.012680

Pollutant	Emissions Per Year (TONs)
PM 10	0.001079
PM 2.5	0.000944
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000909
N_2O	0.000177

Pollutant	Emissions Per Year (TONs)
CO_2	21.606135
CO_2e	21.678544

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.015310
SO_x	0.007217
NO_x	0.222574
CO	0.012680

Pollutant	Emissions Per Year (TONs)
PM 10	0.001079
PM 2.5	0.000944
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000909
N_2O	0.000177

Pollutant	Emissions Per Year (TONs)
CO_2	21.606135
CO_2e	21.678544

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, add 5 T-7A Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.033491
SO_x	0.015787
NO_x	0.486881
CO	0.027737

Pollutant	Emissions Per Year (TONs)
PM 10	0.002361
PM 2.5	0.002066
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001987
N_2O	0.000388

Pollutant	Emissions Per Year (TONs)
CO_2	47.263420
CO_2e	47.421816

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.033491
SO_x	0.015787
NO_x	0.486881
CO	0.027737

Pollutant	Emissions Per Year (TONs)
PM 10	0.002361
PM 2.5	0.002066
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001987
N_2O	0.000388

Pollutant	Emissions Per Year (TONs)
CO_2	47.263420
CO_2e	47.421816

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, add 64 T-7A Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.416443
SO_x	0.196297
NO_x	6.054013
CO	0.344895

Pollutant	Emissions Per Year (TONs)
PM 10	0.029353
PM 2.5	0.025684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.024711
N_2O	0.004821

Pollutant	Emissions Per Year (TONs)
CO_2	587.686872
CO_2e	589.656407

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.416443
SO_x	0.196297
NO_x	6.054013
CO	0.344895

Pollutant	Emissions Per Year (TONs)
PM 10	0.029353
PM 2.5	0.025684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.024711
N_2O	0.004821

Pollutant	Emissions Per Year (TONs)
CO_2	587.686872
CO_2e	589.656407

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		64
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, add 6 T-7A Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		6
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2034, add 8 T-7A Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.055117
SO_x	0.025980
NO_x	0.801266
CO	0.045648

Pollutant	Emissions Per Year (TONs)
PM 10	0.003885
PM 2.5	0.003399
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003271
N_2O	0.000638

Pollutant	Emissions Per Year (TONs)
CO_2	77.782086
CO_2e	78.042760

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.055117
SO_x	0.025980
NO_x	0.801266
CO	0.045648

Pollutant	Emissions Per Year (TONs)
PM 10	0.003885
PM 2.5	0.003399
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003271
N_2O	0.000638

Pollutant	Emissions Per Year (TONs)
CO_2	77.782086
CO_2e	78.042760

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 8
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:

In 2034, add 39 T-7A Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.306016
SO_x	0.144246
NO_x	4.448698
CO	0.253441

Pollutant	Emissions Per Year (TONs)
PM 10	0.021569
PM 2.5	0.018873
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018159
N_2O	0.003543

Pollutant	Emissions Per Year (TONs)
CO_2	431.852623
CO_2e	433.299906

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.306016
SO_x	0.144246
NO_x	4.448698
CO	0.253441

Pollutant	Emissions Per Year (TONs)
PM 10	0.021569
PM 2.5	0.018873
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018159
N_2O	0.003543

Pollutant	Emissions Per Year (TONs)
CO_2	431.852623
CO_2e	433.299906

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 39
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 13 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.094542
SO_x	0.044564
NO_x	1.374394
CO	0.078299

Pollutant	Emissions Per Year (TONs)
PM 10	0.006664
PM 2.5	0.005831
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005610
N_2O	0.001095

Pollutant	Emissions Per Year (TONs)
CO_2	133.417884
CO_2e	133.865012

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.094542
SO_x	0.044564
NO_x	1.374394
CO	0.078299

Pollutant	Emissions Per Year (TONs)
PM 10	0.006664
PM 2.5	0.005831
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005610
N_2O	0.001095

Pollutant	Emissions Per Year (TONs)
CO_2	133.417884
CO_2e	133.865012

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, add 127 T-7A Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.008098
SO_x	0.004505
NO_x	0.057529
CO	0.012771

Pollutant	Emissions Per Year (TONs)
PM 10	0.000486
PM 2.5	0.000412
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000567
N_2O	0.000111

Pollutant	Emissions Per Year (TONs)
CO_2	13.486032
CO_2e	13.531229

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.008098
SO_x	0.004505
NO_x	0.057529
CO	0.012771

Pollutant	Emissions Per Year (TONs)
PM 10	0.000486
PM 2.5	0.000412
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000567
N_2O	0.000111

Pollutant	Emissions Per Year (TONs)
CO_2	13.486032
CO_2e	13.531229

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		127
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, add 5 T-38C Low-Altitude Operations in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.002775
SO_x	0.003959
NO_x	0.007104
CO	0.114663

Pollutant	Emissions Per Year (TONs)
PM 10	0.004181
PM 2.5	0.003737
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000498
N_2O	0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	11.852728
CO_2e	11.892450

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.002775
SO_x	0.003959
NO_x	0.007104
CO	0.114663

Pollutant	Emissions Per Year (TONs)
PM 10	0.004181
PM 2.5	0.003737
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000498
N_2O	0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	11.852728
CO_2e	11.892450

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, add 7 T-38C Low-Altitude Operations in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.006799
SO_x	0.009700
NO_x	0.017405
CO	0.280924

Pollutant	Emissions Per Year (TONs)
PM 10	0.010243
PM 2.5	0.009156
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001221
N_2O	0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	29.039184
CO_2e	29.136504

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.006799
SO_x	0.009700
NO_x	0.017405
CO	0.280924

Pollutant	Emissions Per Year (TONs)
PM 10	0.010243
PM 2.5	0.009156
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001221
N_2O	0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	29.039184
CO_2e	29.136504

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, add 84 T-38C Low-Altitude Operations in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.079254
SO_x	0.113069
NO_x	0.202890
CO	3.274775

Pollutant	Emissions Per Year (TONs)
PM 10	0.119409
PM 2.5	0.106729
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014234
N_2O	0.002777

Pollutant	Emissions Per Year (TONs)
CO_2	338.513912
CO_2e	339.648385

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.079254
SO_x	0.113069
NO_x	0.202890
CO	3.274775

Pollutant	Emissions Per Year (TONs)
PM 10	0.119409
PM 2.5	0.106729
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014234
N_2O	0.002777

Pollutant	Emissions Per Year (TONs)
CO_2	338.513912
CO_2e	339.648385

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 84
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, add 8 T-38C Low-Altitude Operations in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007992
SO_x	0.011402
NO_x	0.020460
CO	0.330229

Pollutant	Emissions Per Year (TONs)
PM 10	0.012041
PM 2.5	0.010763
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001435
N_2O	0.000280

Pollutant	Emissions Per Year (TONs)
CO_2	34.135857
CO_2e	34.250257

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.007992
SO_x	0.011402
NO_x	0.020460
CO	0.330229

Pollutant	Emissions Per Year (TONs)
PM 10	0.012041
PM 2.5	0.010763
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001435
N_2O	0.000280

Pollutant	Emissions Per Year (TONs)
CO_2	34.135857
CO_2e	34.250257

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 8
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2034, add 10 T-38C Low-Altitude Operations in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.009990
SO_x	0.014252
NO_x	0.025574
CO	0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	0.015052
PM 2.5	0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001794
N_2O	0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	42.669821
CO_2e	42.812822

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.009990
SO_x	0.014252
NO_x	0.025574
CO	0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	0.015052
PM 2.5	0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001794
N_2O	0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	42.669821
CO_2e	42.812822

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:

In 2034, add 51 T-38C Low-Altitude Operations in VR-1143 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.058025
SO_x	0.082783
NO_x	0.148545
CO	2.397603

Pollutant	Emissions Per Year (TONs)
PM 10	0.087425
PM 2.5	0.078141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010421
N_2O	0.002033

Pollutant	Emissions Per Year (TONs)
CO_2	247.840542
CO_2e	248.671139

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.058025
SO_x	0.082783
NO_x	0.148545
CO	2.397603

Pollutant	Emissions Per Year (TONs)
PM 10	0.087425
PM 2.5	0.078141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010421
N_2O	0.002033

Pollutant	Emissions Per Year (TONs)
CO_2	247.840542
CO_2e	248.671139

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 51
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2034, add 17 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.017927
SO_x	0.025575
NO_x	0.045892
CO	0.740723

Pollutant	Emissions Per Year (TONs)
PM 10	0.027009
PM 2.5	0.024141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003220
N_2O	0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	76.568623
CO_2e	76.825230

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.017927
SO_x	0.025575
NO_x	0.045892
CO	0.740723

Pollutant	Emissions Per Year (TONs)
PM 10	0.027009
PM 2.5	0.024141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003220
N_2O	0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	76.568623
CO_2e	76.825230

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 17
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, add 166 T-38C Low-Altitude Operations in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.009476
SO_x	0.002127
NO_x	0.001498
CO	0.170646

Pollutant	Emissions Per Year (TONs)
PM 10	0.004039
PM 2.5	0.003627
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000268
N_2O	0.000052

Pollutant	Emissions Per Year (TONs)
CO_2	6.367958
CO_2e	6.389299

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.009476
SO_x	0.002127
NO_x	0.001498
CO	0.170646

Pollutant	Emissions Per Year (TONs)
PM 10	0.004039
PM 2.5	0.003627
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000268
N_2O	0.000052

Pollutant	Emissions Per Year (TONs)
CO_2	6.367958
CO_2e	6.389299

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 166
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, add 16 T-7A Low-Altitude Operations in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.061242
SO_x	0.028867
NO_x	0.890296
CO	0.050720

Pollutant	Emissions Per Year (TONs)
PM 10	0.004317
PM 2.5	0.003777
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003634
N_2O	0.000709

Pollutant	Emissions Per Year (TONs)
CO_2	86.424540
CO_2e	86.714178

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.061242
SO_x	0.028867
NO_x	0.890296
CO	0.050720

Pollutant	Emissions Per Year (TONs)
PM 10	0.004317
PM 2.5	0.003777
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003634
N_2O	0.000709

Pollutant	Emissions Per Year (TONs)
CO_2	86.424540
CO_2e	86.714178

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		16
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, add 19 T-7A Low-Altitude Operations in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.127268
SO_x	0.059990
NO_x	1.850146
CO	0.105402

Pollutant	Emissions Per Year (TONs)
PM 10	0.008970
PM 2.5	0.007849
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007552
N_2O	0.001473

Pollutant	Emissions Per Year (TONs)
CO_2	179.600997
CO_2e	180.202900

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.127268
SO_x	0.059990
NO_x	1.850146
CO	0.105402

Pollutant	Emissions Per Year (TONs)
PM 10	0.008970
PM 2.5	0.007849
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007552
N_2O	0.001473

Pollutant	Emissions Per Year (TONs)
CO_2	179.600997
CO_2e	180.202900

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		19
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, add 245 T-7A Low-Altitude Operations in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.594195
SO_x	0.751449
NO_x	23.175518
CO	1.320302

Pollutant	Emissions Per Year (TONs)
PM 10	0.112366
PM 2.5	0.098320
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.094598
N_2O	0.018456

Pollutant	Emissions Per Year (TONs)
CO_2	2249.738805
CO_2e	2257.278433

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.594195
SO_x	0.751449
NO_x	23.175518
CO	1.320302

Pollutant	Emissions Per Year (TONs)
PM 10	0.112366
PM 2.5	0.098320
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.094598
N_2O	0.018456

Pollutant	Emissions Per Year (TONs)
CO_2	2249.738805
CO_2e	2257.278433

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 245
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, add 23 T-7A Low-Altitude Operations in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.158463
SO_x	0.074694
NO_x	2.303641
CO	0.131238

Pollutant	Emissions Per Year (TONs)
PM 10	0.011169
PM 2.5	0.009773
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009403
N_2O	0.001835

Pollutant	Emissions Per Year (TONs)
CO_2	223.623497
CO_2e	224.372934

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.158463
SO_x	0.074694
NO_x	2.303641
CO	0.131238

Pollutant	Emissions Per Year (TONs)
PM 10	0.011169
PM 2.5	0.009773
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009403
N_2O	0.001835

Pollutant	Emissions Per Year (TONs)
CO_2	223.623497
CO_2e	224.372934

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, add 30 T-7A Low-Altitude Operations in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.206690
SO_x	0.097427
NO_x	3.004749
CO	0.171180

Pollutant	Emissions Per Year (TONs)
PM 10	0.014568
PM 2.5	0.012747
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012265
N_2O	0.002393

Pollutant	Emissions Per Year (TONs)
CO_2	291.682822
CO_2e	292.660349

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.206690
SO_x	0.097427
NO_x	3.004749
CO	0.171180

Pollutant	Emissions Per Year (TONs)
PM 10	0.014568
PM 2.5	0.012747
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012265
N_2O	0.002393

Pollutant	Emissions Per Year (TONs)
CO_2	291.682822
CO_2e	292.660349

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		30
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, add 151 T-7A Low-Altitude Operations in VR-1143 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.184833
SO_x	0.558490
NO_x	17.224445
CO	0.981271

Pollutant	Emissions Per Year (TONs)
PM 10	0.083512
PM 2.5	0.073073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070307
N_2O	0.013717

Pollutant	Emissions Per Year (TONs)
CO_2	1672.044771
CO_2e	1677.648353

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.184833
SO_x	0.558490
NO_x	17.224445
CO	0.981271

Pollutant	Emissions Per Year (TONs)
PM 10	0.083512
PM 2.5	0.073073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070307
N_2O	0.013717

Pollutant	Emissions Per Year (TONs)
CO_2	1672.044771
CO_2e	1677.648353

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		151
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 50 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.363622
SO_x	0.171399
NO_x	5.286133
CO	0.301149

Pollutant	Emissions Per Year (TONs)
PM 10	0.025630
PM 2.5	0.022426
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.363622
SO_x	0.171399
NO_x	5.286133
CO	0.301149

Pollutant	Emissions Per Year (TONs)
PM 10	0.025630
PM 2.5	0.022426
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 50
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, add 486 T-7A Low-Altitude Operations in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.030989
SO_x	0.017238
NO_x	0.220150
CO	0.048873

Pollutant	Emissions Per Year (TONs)
PM 10	0.001859
PM 2.5	0.001576
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002170
N_2O	0.000423

Pollutant	Emissions Per Year (TONs)
CO_2	51.607966
CO_2e	51.780922

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.030989
SO_x	0.017238
NO_x	0.220150
CO	0.048873

Pollutant	Emissions Per Year (TONs)
PM 10	0.001859
PM 2.5	0.001576
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002170
N_2O	0.000423

Pollutant	Emissions Per Year (TONs)
CO_2	51.607966
CO_2e	51.780922

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 486
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, remove 18 T-38C Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009990
SO_x	-0.014252
NO_x	-0.025574
CO	-0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	-0.015052
PM 2.5	-0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009990
SO_x	-0.014252
NO_x	-0.025574
CO	-0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	-0.015052
PM 2.5	-0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, remove 22 T-38C Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021368
SO_x	-0.030484
NO_x	-0.054701
CO	-0.882905

Pollutant	Emissions Per Year (TONs)
PM 10	-0.032194
PM 2.5	-0.028775
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003838
N_2O	-0.000749

Pollutant	Emissions Per Year (TONs)
CO_2	-91.266006
CO_2e	-91.571869

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021368
SO_x	-0.030484
NO_x	-0.054701
CO	-0.882905

Pollutant	Emissions Per Year (TONs)
PM 10	-0.032194
PM 2.5	-0.028775
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003838
N_2O	-0.000749

Pollutant	Emissions Per Year (TONs)
CO_2	-91.266006
CO_2e	-91.571869

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, remove 280 T-38C Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.264180
SO_x	-0.376897
NO_x	-0.676301
CO	-10.915918

Pollutant	Emissions Per Year (TONs)
PM 10	-0.398031
PM 2.5	-0.355762
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.047447
N_2O	-0.009257

Pollutant	Emissions Per Year (TONs)
CO_2	-1128.379706
CO_2e	-1132.161284

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.264180
SO_x	-0.376897
NO_x	-0.676301
CO	-10.915918

Pollutant	Emissions Per Year (TONs)
PM 10	-0.398031
PM 2.5	-0.355762
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.047447
N_2O	-0.009257

Pollutant	Emissions Per Year (TONs)
CO_2	-1128.379706
CO_2e	-1132.161284

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 280
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, remove 26 T-38C Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025974
SO_x	-0.037056
NO_x	-0.066493
CO	-1.073246

Pollutant	Emissions Per Year (TONs)
PM 10	-0.039134
PM 2.5	-0.034978
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004665
N_2O	-0.000910

Pollutant	Emissions Per Year (TONs)
CO_2	-110.941534
CO_2e	-111.313336

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025974
SO_x	-0.037056
NO_x	-0.066493
CO	-1.073246

Pollutant	Emissions Per Year (TONs)
PM 10	-0.039134
PM 2.5	-0.034978
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004665
N_2O	-0.000910

Pollutant	Emissions Per Year (TONs)
CO_2	-110.941534
CO_2e	-111.313336

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 26
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, remove 34 T-38C Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.033966
SO_x	-0.048458
NO_x	-0.086953
CO	-1.403475

Pollutant	Emissions Per Year (TONs)
PM 10	-0.051175
PM 2.5	-0.045741
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006100
N_2O	-0.001190

Pollutant	Emissions Per Year (TONs)
CO_2	-145.077391
CO_2e	-145.563594

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.033966
SO_x	-0.048458
NO_x	-0.086953
CO	-1.403475

Pollutant	Emissions Per Year (TONs)
PM 10	-0.051175
PM 2.5	-0.045741
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006100
N_2O	-0.001190

Pollutant	Emissions Per Year (TONs)
CO_2	-145.077391
CO_2e	-145.563594

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		34
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, remove 172 T-38C Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.195693
SO_x	-0.279189
NO_x	-0.500974
CO	-8.086035

Pollutant	Emissions Per Year (TONs)
PM 10	-0.294844
PM 2.5	-0.263533
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035146
N_2O	-0.006857

Pollutant	Emissions Per Year (TONs)
CO_2	-835.854379
CO_2e	-838.655606

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.195693
SO_x	-0.279189
NO_x	-0.500974
CO	-8.086035

Pollutant	Emissions Per Year (TONs)
PM 10	-0.294844
PM 2.5	-0.263533
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035146
N_2O	-0.006857

Pollutant	Emissions Per Year (TONs)
CO_2	-835.854379
CO_2e	-838.655606

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		172
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, remove 57 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.060107
SO_x	-0.085752
NO_x	-0.153873
CO	-2.483601

Pollutant	Emissions Per Year (TONs)
PM 10	-0.090560
PM 2.5	-0.080943
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010795
N_2O	-0.002106

Pollutant	Emissions Per Year (TONs)
CO_2	-256.730088
CO_2e	-257.590477

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.060107
SO_x	-0.085752
NO_x	-0.153873
CO	-2.483601

Pollutant	Emissions Per Year (TONs)
PM 10	-0.090560
PM 2.5	-0.080943
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010795
N_2O	-0.002106

Pollutant	Emissions Per Year (TONs)
CO_2	-256.730088
CO_2e	-257.590477

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		57
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 554 T-38C Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.031625
SO_x	-0.007099
NO_x	-0.005000
CO	-0.569505

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013478
PM 2.5	-0.012106
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000894
N_2O	-0.000174

Pollutant	Emissions Per Year (TONs)
CO_2	-21.252101
CO_2e	-21.323324

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.031625
SO_x	-0.007099
NO_x	-0.005000
CO	-0.569505

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013478
PM 2.5	-0.012106
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000894
N_2O	-0.000174

Pollutant	Emissions Per Year (TONs)
CO_2	-21.252101
CO_2e	-21.323324

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		554
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, add 15 T-7A Low-Altitude Operations in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.057414
SO_x	0.027063
NO_x	0.834653
CO	0.047550

Pollutant	Emissions Per Year (TONs)
PM 10	0.004047
PM 2.5	0.003541
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003407
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.023006
CO_2e	81.294541

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.057414
SO_x	0.027063
NO_x	0.834653
CO	0.047550

Pollutant	Emissions Per Year (TONs)
PM 10	0.004047
PM 2.5	0.003541
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003407
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.023006
CO_2e	81.294541

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, add 18 T-7A Low-Altitude Operations in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.120569
SO_x	0.056832
NO_x	1.752770
CO	0.099855

Pollutant	Emissions Per Year (TONs)
PM 10	0.008498
PM 2.5	0.007436
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007154
N_2O	0.001396

Pollutant	Emissions Per Year (TONs)
CO_2	170.148313
CO_2e	170.718537

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.120569
SO_x	0.056832
NO_x	1.752770
CO	0.099855

Pollutant	Emissions Per Year (TONs)
PM 10	0.008498
PM 2.5	0.007436
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007154
N_2O	0.001396

Pollutant	Emissions Per Year (TONs)
CO_2	170.148313
CO_2e	170.718537

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, add 229 T-7A Low-Altitude Operations in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.490084
SO_x	0.702374
NO_x	21.662015
CO	1.234078

Pollutant	Emissions Per Year (TONs)
PM 10	0.105028
PM 2.5	0.091899
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.088420
N_2O	0.017251

Pollutant	Emissions Per Year (TONs)
CO_2	2102.817088
CO_2e	2109.864332

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.490084
SO_x	0.702374
NO_x	21.662015
CO	1.234078

Pollutant	Emissions Per Year (TONs)
PM 10	0.105028
PM 2.5	0.091899
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.088420
N_2O	0.017251

Pollutant	Emissions Per Year (TONs)
CO_2	2102.817088
CO_2e	2109.864332

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		229
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, add 22 T-7A Low-Altitude Operations in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.151573
SO_x	0.071446
NO_x	2.203483
CO	0.125532

Pollutant	Emissions Per Year (TONs)
PM 10	0.010684
PM 2.5	0.009348
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.151573
SO_x	0.071446
NO_x	2.203483
CO	0.125532

Pollutant	Emissions Per Year (TONs)
PM 10	0.010684
PM 2.5	0.009348
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008994
N_2O	0.001755

Pollutant	Emissions Per Year (TONs)
CO_2	213.900736
CO_2e	214.617589

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, add 28 T-7A Low-Altitude Operations in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.192911
SO_x	0.090932
NO_x	2.804432
CO	0.159768

Pollutant	Emissions Per Year (TONs)
PM 10	0.013597
PM 2.5	0.011898
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011447
N_2O	0.002233

Pollutant	Emissions Per Year (TONs)
CO_2	272.237301
CO_2e	273.149659

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.192911
SO_x	0.090932
NO_x	2.804432
CO	0.159768

Pollutant	Emissions Per Year (TONs)
PM 10	0.013597
PM 2.5	0.011898
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011447
N_2O	0.002233

Pollutant	Emissions Per Year (TONs)
CO_2	272.237301
CO_2e	273.149659

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		28
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, add 141 T-7A Low-Altitude Operations in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.106367
SO_x	0.521504
NO_x	16.083754
CO	0.916287

Pollutant	Emissions Per Year (TONs)
PM 10	0.077982
PM 2.5	0.068234
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.065651
N_2O	0.012809

Pollutant	Emissions Per Year (TONs)
CO_2	1561.313329
CO_2e	1566.545813

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.106367
SO_x	0.521504
NO_x	16.083754
CO	0.916287

Pollutant	Emissions Per Year (TONs)
PM 10	0.077982
PM 2.5	0.068234
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.065651
N_2O	0.012809

Pollutant	Emissions Per Year (TONs)
CO_2	1561.313329
CO_2e	1566.545813

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		141
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 46 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.334532
SO_x	0.157687
NO_x	4.863242
CO	0.277057

Pollutant	Emissions Per Year (TONs)
PM 10	0.023579
PM 2.5	0.020632
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019851
N_2O	0.003873

Pollutant	Emissions Per Year (TONs)
CO_2	472.094049
CO_2e	473.676195

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.334532
SO_x	0.157687
NO_x	4.863242
CO	0.277057

Pollutant	Emissions Per Year (TONs)
PM 10	0.023579
PM 2.5	0.020632
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019851
N_2O	0.003873

Pollutant	Emissions Per Year (TONs)
CO_2	472.094049
CO_2e	473.676195

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 46
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, add 454 T-7A Low-Altitude Operations in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.028949
SO_x	0.016103
NO_x	0.205655
CO	0.045655

Pollutant	Emissions Per Year (TONs)
PM 10	0.001736
PM 2.5	0.001472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002027
N_2O	0.000395

Pollutant	Emissions Per Year (TONs)
CO_2	48.209911
CO_2e	48.371478

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.028949
SO_x	0.016103
NO_x	0.205655
CO	0.045655

Pollutant	Emissions Per Year (TONs)
PM 10	0.001736
PM 2.5	0.001472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002027
N_2O	0.000395

Pollutant	Emissions Per Year (TONs)
CO_2	48.209911
CO_2e	48.371478

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 454
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, remove 18 T-38C Low-Altitude Operations in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009990
SO_x	-0.014252
NO_x	-0.025574
CO	-0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	-0.015052
PM 2.5	-0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009990
SO_x	-0.014252
NO_x	-0.025574
CO	-0.412787

Pollutant	Emissions Per Year (TONs)
PM 10	-0.015052
PM 2.5	-0.013453
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, remove 23 T-38C Low-Altitude Operations in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.022339
SO_x	-0.031870
NO_x	-0.057187
CO	-0.923037

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033657
PM 2.5	-0.030083
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004012
N_2O	-0.000783

Pollutant	Emissions Per Year (TONs)
CO_2	-95.414460
CO_2e	-95.734226

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.022339
SO_x	-0.031870
NO_x	-0.057187
CO	-0.923037

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033657
PM 2.5	-0.030083
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004012
N_2O	-0.000783

Pollutant	Emissions Per Year (TONs)
CO_2	-95.414460
CO_2e	-95.734226

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, remove 287 T-38C Low-Altitude Operations in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.270785
SO_x	-0.386319
NO_x	-0.693208
CO	-11.188816

Pollutant	Emissions Per Year (TONs)
PM 10	-0.407982
PM 2.5	-0.364656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.048633
N_2O	-0.009488

Pollutant	Emissions Per Year (TONs)
CO_2	-1156.589198
CO_2e	-1160.465316

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.270785
SO_x	-0.386319
NO_x	-0.693208
CO	-11.188816

Pollutant	Emissions Per Year (TONs)
PM 10	-0.407982
PM 2.5	-0.364656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.048633
N_2O	-0.009488

Pollutant	Emissions Per Year (TONs)
CO_2	-1156.589198
CO_2e	-1160.465316

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 287
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, remove 27 T-38C Low-Altitude Operations in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, remove 35 T-38C Low-Altitude Operations in VR-1142 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.034965
SO_x	-0.049883
NO_x	-0.089510
CO	-1.444754

Pollutant	Emissions Per Year (TONs)
PM 10	-0.052681
PM 2.5	-0.047086
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006280
N_2O	-0.001225

Pollutant	Emissions Per Year (TONs)
CO_2	-149.344373
CO_2e	-149.844876

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.034965
SO_x	-0.049883
NO_x	-0.089510
CO	-1.444754

Pollutant	Emissions Per Year (TONs)
PM 10	-0.052681
PM 2.5	-0.047086
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006280
N_2O	-0.001225

Pollutant	Emissions Per Year (TONs)
CO_2	-149.344373
CO_2e	-149.844876

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		35
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, remove 176 T-38C Low-Altitude Operations in VR-1143 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.200244
SO_x	-0.285681
NO_x	-0.512625
CO	-8.274082

Pollutant	Emissions Per Year (TONs)
PM 10	-0.301701
PM 2.5	-0.269662
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035964
N_2O	-0.007017

Pollutant	Emissions Per Year (TONs)
CO_2	-855.292852
CO_2e	-858.159225

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.200244
SO_x	-0.285681
NO_x	-0.512625
CO	-8.274082

Pollutant	Emissions Per Year (TONs)
PM 10	-0.301701
PM 2.5	-0.269662
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035964
N_2O	-0.007017

Pollutant	Emissions Per Year (TONs)
CO_2	-855.292852
CO_2e	-858.159225

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		176
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 58 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.061161
SO_x	-0.087256
NO_x	-0.156572
CO	-2.527173

Pollutant	Emissions Per Year (TONs)
PM 10	-0.092149
PM 2.5	-0.082363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010985
N_2O	-0.002143

Pollutant	Emissions Per Year (TONs)
CO_2	-261.234125
CO_2e	-262.109608

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.061161
SO_x	-0.087256
NO_x	-0.156572
CO	-2.527173

Pollutant	Emissions Per Year (TONs)
PM 10	-0.092149
PM 2.5	-0.082363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010985
N_2O	-0.002143

Pollutant	Emissions Per Year (TONs)
CO_2	-261.234125
CO_2e	-262.109608

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		58
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 568 T-38C Low-Altitude Operations in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.032424
SO_x	-0.007278
NO_x	-0.005127
CO	-0.583897

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013819
PM 2.5	-0.012412
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000916
N_2O	-0.000179

Pollutant	Emissions Per Year (TONs)
CO_2	-21.789158
CO_2e	-21.862181

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.032424
SO_x	-0.007278
NO_x	-0.005127
CO	-0.583897

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013819
PM 2.5	-0.012412
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000916
N_2O	-0.000179

Pollutant	Emissions Per Year (TONs)
CO_2	-21.789158
CO_2e	-21.862181

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		568
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, add 2 T-7A Low-Altitude Operations in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007655
SO_x	0.003608
NO_x	0.111287
CO	0.006340

Pollutant	Emissions Per Year (TONs)
PM 10	0.000540
PM 2.5	0.000472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.007655
SO_x	0.003608
NO_x	0.111287
CO	0.006340

Pollutant	Emissions Per Year (TONs)
PM 10	0.000540
PM 2.5	0.000472
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, add 3 T-7A Low-Altitude Operations in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.020095
SO_x	0.009472
NO_x	0.292128
CO	0.016642

Pollutant	Emissions Per Year (TONs)
PM 10	0.001416
PM 2.5	0.001239
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.020095
SO_x	0.009472
NO_x	0.292128
CO	0.016642

Pollutant	Emissions Per Year (TONs)
PM 10	0.001416
PM 2.5	0.001239
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, add 37 T-7A Low-Altitude Operations in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.240756
SO_x	0.113484
NO_x	3.499976
CO	0.199393

Pollutant	Emissions Per Year (TONs)
PM 10	0.016970
PM 2.5	0.014848
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014286
N_2O	0.002787

Pollutant	Emissions Per Year (TONs)
CO_2	339.756473
CO_2e	340.895110

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.240756
SO_x	0.113484
NO_x	3.499976
CO	0.199393

Pollutant	Emissions Per Year (TONs)
PM 10	0.016970
PM 2.5	0.014848
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014286
N_2O	0.002787

Pollutant	Emissions Per Year (TONs)
CO_2	339.756473
CO_2e	340.895110

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		37
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, add 4 T-7A Low-Altitude Operations in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.027559
SO_x	0.012990
NO_x	0.400633
CO	0.022824

Pollutant	Emissions Per Year (TONs)
PM 10	0.001942
PM 2.5	0.001700
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.027559
SO_x	0.012990
NO_x	0.400633
CO	0.022824

Pollutant	Emissions Per Year (TONs)
PM 10	0.001942
PM 2.5	0.001700
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, add 5 T-7A Low-Altitude Operations in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, add 23 T-7A Low-Altitude Operations in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.180471
SO_x	0.085068
NO_x	2.623591
CO	0.149465

Pollutant	Emissions Per Year (TONs)
PM 10	0.012720
PM 2.5	0.011130
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010709
N_2O	0.002089

Pollutant	Emissions Per Year (TONs)
CO_2	254.682316
CO_2e	255.535842

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.180471
SO_x	0.085068
NO_x	2.623591
CO	0.149465

Pollutant	Emissions Per Year (TONs)
PM 10	0.012720
PM 2.5	0.011130
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010709
N_2O	0.002089

Pollutant	Emissions Per Year (TONs)
CO_2	254.682316
CO_2e	255.535842

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		23
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 8 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.058179
SO_x	0.027424
NO_x	0.845781
CO	0.048184

Pollutant	Emissions Per Year (TONs)
PM 10	0.004101
PM 2.5	0.003588
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.058179
SO_x	0.027424
NO_x	0.845781
CO	0.048184

Pollutant	Emissions Per Year (TONs)
PM 10	0.004101
PM 2.5	0.003588
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 8
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, add 74 T-7A Low-Altitude Operations in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.004719
SO_x	0.002625
NO_x	0.033521
CO	0.007442

Pollutant	Emissions Per Year (TONs)
PM 10	0.000283
PM 2.5	0.000240
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000330
N_2O	0.000064

Pollutant	Emissions Per Year (TONs)
CO_2	7.858003
CO_2e	7.884338

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.004719
SO_x	0.002625
NO_x	0.033521
CO	0.007442

Pollutant	Emissions Per Year (TONs)
PM 10	0.000283
PM 2.5	0.000240
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000330
N_2O	0.000064

Pollutant	Emissions Per Year (TONs)
CO_2	7.858003
CO_2e	7.884338

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 74
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, remove 6 T-38C Low-Altitude Operations in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005828
SO_x	-0.008314
NO_x	-0.014918
CO	-0.240792

Pollutant	Emissions Per Year (TONs)
PM 10	-0.008780
PM 2.5	-0.007848
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001047
N_2O	-0.000204

Pollutant	Emissions Per Year (TONs)
CO_2	-24.890729
CO_2e	-24.974146

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005828
SO_x	-0.008314
NO_x	-0.014918
CO	-0.240792

Pollutant	Emissions Per Year (TONs)
PM 10	-0.008780
PM 2.5	-0.007848
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001047
N_2O	-0.000204

Pollutant	Emissions Per Year (TONs)
CO_2	-24.890729
CO_2e	-24.974146

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, remove 76 T-38C Low-Altitude Operations in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.071706
SO_x	-0.102301
NO_x	-0.183567
CO	-2.962892

Pollutant	Emissions Per Year (TONs)
PM 10	-0.108037
PM 2.5	-0.096564
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012878
N_2O	-0.002513

Pollutant	Emissions Per Year (TONs)
CO_2	-306.274492
CO_2e	-307.300920

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.071706
SO_x	-0.102301
NO_x	-0.183567
CO	-2.962892

Pollutant	Emissions Per Year (TONs)
PM 10	-0.108037
PM 2.5	-0.096564
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012878
N_2O	-0.002513

Pollutant	Emissions Per Year (TONs)
CO_2	-306.274492
CO_2e	-307.300920

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 76
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, remove 7 T-38C Low-Altitude Operations in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, remove 9 T-38C Low-Altitude Operations in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008991
SO_x	-0.012827
NO_x	-0.023017
CO	-0.371508

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013546
PM 2.5	-0.012108
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001615
N_2O	-0.000315

Pollutant	Emissions Per Year (TONs)
CO_2	-38.402839
CO_2e	-38.531539

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008991
SO_x	-0.012827
NO_x	-0.023017
CO	-0.371508

Pollutant	Emissions Per Year (TONs)
PM 10	-0.013546
PM 2.5	-0.012108
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001615
N_2O	-0.000315

Pollutant	Emissions Per Year (TONs)
CO_2	-38.402839
CO_2e	-38.531539

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, remove 47 T-38C Low-Altitude Operations in VR-1143 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.053474
SO_x	-0.076290
NO_x	-0.136894
CO	-2.209556

Pollutant	Emissions Per Year (TONs)
PM 10	-0.080568
PM 2.5	-0.072012
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009604
N_2O	-0.001874

Pollutant	Emissions Per Year (TONs)
CO_2	-228.402069
CO_2e	-229.167520

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.053474
SO_x	-0.076290
NO_x	-0.136894
CO	-2.209556

Pollutant	Emissions Per Year (TONs)
PM 10	-0.080568
PM 2.5	-0.072012
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009604
N_2O	-0.001874

Pollutant	Emissions Per Year (TONs)
CO_2	-228.402069
CO_2e	-229.167520

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64

Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		47
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, remove 15 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.015818
SO_x	-0.022566
NO_x	-0.040493
CO	-0.653579

Pollutant	Emissions Per Year (TONs)
PM 10	-0.023832
PM 2.5	-0.021301
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002841
N_2O	-0.000554

Pollutant	Emissions Per Year (TONs)
CO_2	-67.560550
CO_2e	-67.786968

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.015818
SO_x	-0.022566
NO_x	-0.040493
CO	-0.653579

Pollutant	Emissions Per Year (TONs)
PM 10	-0.023832
PM 2.5	-0.021301
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002841
N_2O	-0.000554

Pollutant	Emissions Per Year (TONs)
CO_2	-67.560550
CO_2e	-67.786968

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 150 T-38C Low-Altitude Operations in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008563
SO_x	-0.001922
NO_x	-0.001354
CO	-0.154198

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003649
PM 2.5	-0.003278
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000242
N_2O	-0.000047

Pollutant	Emissions Per Year (TONs)
CO_2	-5.754179
CO_2e	-5.773463

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008563
SO_x	-0.001922
NO_x	-0.001354
CO	-0.154198

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003649
PM 2.5	-0.003278
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000242
N_2O	-0.000047

Pollutant	Emissions Per Year (TONs)
CO_2	-5.754179
CO_2e	-5.773463

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		150
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, remove 5 T-38C Low-Altitude Operations in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002775
SO_x	-0.003959
NO_x	-0.007104
CO	-0.114663

Pollutant	Emissions Per Year (TONs)
PM 10	-0.004181
PM 2.5	-0.003737
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000498
N_2O	-0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	-11.852728
CO_2e	-11.892450

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002775
SO_x	-0.003959
NO_x	-0.007104
CO	-0.114663

Pollutant	Emissions Per Year (TONs)
PM 10	-0.004181
PM 2.5	-0.003737
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000498
N_2O	-0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	-11.852728
CO_2e	-11.892450

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: Alternative 2 GHG Report (Destination Cycles)

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, SUA Destination Cycle

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset

by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2034	15,086	0.63432752	0.12375744	15,136	68,039	No
2035	32,562	1.36919628	0.2671305	32,671	68,039	No
2036	49,321	2.07388416	0.40461526	49,486	68,039	No
2037	49,956	2.10058093	0.40982381	50,124	68,039	No
2038 [SS Year]	49,956	2.10058093	0.40982381	50,124	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2034-2038	State Total	3,503,263,447	17,773,124	679,479	4,180,972,834
2034-2038	U.S. Total	25,682,270,895	128,134,558	7,503,538	31,258,476,148
2034-2038	Action	196,881	8.27857	1.615151	197,541
Percent of State Totals		0.00561994%	0.00004658%	0.00023770%	0.00472476%
Percent of U.S. Totals		0.00076660%	0.00000646%	0.00002153%	0.00063196%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00008468%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

SUA ROI: Alternative 2 ACAM Detail Report (Destination Cycles)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB

State(s): Texas, Oklahoma

County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, SUA Destination Cycle

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Destination Cycles (IR-103)
3.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-158)
4.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-159)
5.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Destination Cycles(VR-1142)
7.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1146)
9.	Aircraft	2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
10.	Aircraft	2034: Add T-7A MOA Destination Cycles (Hollis MOA)
11.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)
12.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)
13.	Aircraft	2034: Add T-7A MOA Destination Cycles (Washita MOA)
14.	Aircraft	2034: Remove T-38C MTR Destination Cycles (IR-103)
15.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-158)
16.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-159)
17.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1141)
18.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1142)
19.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1143)
20.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1146)
21.	Aircraft	2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
22.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Hollis MOA)
23.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
24.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
25.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Washita MOA)
26.	Aircraft	2035: Add T-7A MTR Destination Cycles (IR-103)
27.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-158)
28.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-159)
29.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1141)
30.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1142)
31.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1143)
32.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1146)
33.	Aircraft	2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

34.	Aircraft	2035: Add T-7A MOA Destination Cycles (Hollis MOA)
35.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)
36.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 2 MOA)
37.	Aircraft	2035: Add T-7A MOA Destination Cycles (Washita MOA)
38.	Aircraft	2035: Remove T-38C MTR Destination Cycles (IR-103)
39.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-158)
40.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-159)
41.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1141)
42.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1142)
43.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1143)
44.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1146)
45.	Aircraft	2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
46.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Hollis MOA)
47.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
48.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
49.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Washita MOA)
50.	Aircraft	2036: Add T-7A MTR Destination Cycles (IR-103)
51.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-158)
52.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-159)
53.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1141)
54.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1142)
55.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1143)
56.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1146)
57.	Aircraft	2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
58.	Aircraft	2036: Add T-7A MOA Destination Cycles (Hollis MOA)
59.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)
60.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)
61.	Aircraft	2036: Add T-7A MOA Destination Cycles (Washita MOA)
62.	Aircraft	2036: Remove T-38C MTR Destination Cycles (IR-103)
63.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-158)
64.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-159)
65.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1141)
66.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1142)
67.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1143)
68.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1146)
69.	Aircraft	2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
70.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Hollis MOA)
71.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
72.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
73.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Washita MOA)
74.	Aircraft	2037: Add T-7A MTR Destination Cycles (IR-103)
75.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-158)
76.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-159)
77.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1141)
78.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1142)
79.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1143)
80.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1146)
81.	Aircraft	2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
82.	Aircraft	2037: Add T-7A MOA Destination Cycles (Hollis MOA)
83.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)
84.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)
85.	Aircraft	2037: Add T-7A MOA Destination Cycles (Washita MOA)
86.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-158)
87.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-159)
88.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1141)
89.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1142)

90.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1143)
91.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1146)
92.	Aircraft	2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
93.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Hollis MOA)
94.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
95.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
96.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Washita MOA)
97.	Aircraft	2037: Remove T-38C MTR Destination Cycles (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, add 4 T-7A Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000909
N_2O	0.000177

Pollutant	Emissions Per Year (TONs)
CO_2	21.606135
CO_2e	21.678544

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000909
N_2O	0.000177

Pollutant	Emissions Per Year (TONs)
CO_2	21.606135
CO_2e	21.678544

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, add 5 T-7A Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001987
N_2O	0.000388

Pollutant	Emissions Per Year (TONs)
CO_2	47.263420
CO_2e	47.421816

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001987
N_2O	0.000388

Pollutant	Emissions Per Year (TONs)
CO_2	47.263420
CO_2e	47.421816

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, add 64 T-7A Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.024711
N_2O	0.004821

Pollutant	Emissions Per Year (TONs)
CO_2	587.686872
CO_2e	589.656407

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.024711
N_2O	0.004821

Pollutant	Emissions Per Year (TONs)
CO_2	587.686872
CO_2e	589.656407

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		64
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, add 6 T-7A Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles(VR-1142)

- Activity Description:
IIn 2034, add 8 T-7A Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003271
N_2O	0.000638

Pollutant	Emissions Per Year (TONs)
CO_2	77.782086
CO_2e	78.042760

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003271
N_2O	0.000638

Pollutant	Emissions Per Year (TONs)
CO_2	77.782086
CO_2e	78.042760

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		8
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2034, add 39 T-7A Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018159
N_2O	0.003543

Pollutant	Emissions Per Year (TONs)
CO_2	431.852623
CO_2e	433.299906

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018159
N_2O	0.003543

Pollutant	Emissions Per Year (TONs)
CO_2	431.852623
CO_2e	433.299906

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		39
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2034, add 14 T-7A Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006042
N_2O	0.001179

Pollutant	Emissions Per Year (TONs)
CO_2	143.680798
CO_2e	144.162320

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006042
N_2O	0.001179

Pollutant	Emissions Per Year (TONs)
CO_2	143.680798
CO_2e	144.162320

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 14
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, add 315 T-7A Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001407
N_2O	0.000274

Pollutant	Emissions Per Year (TONs)
CO_2	33.449608
CO_2e	33.561709

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001407
N_2O	0.000274

Pollutant	Emissions Per Year (TONs)
CO_2	33.449608
CO_2e	33.561709

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 315
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, add 21 T-7A Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003288
N_2O	0.000641

Pollutant	Emissions Per Year (TONs)
CO_2	78.193888
CO_2e	78.455942

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003288
N_2O	0.000641

Pollutant	Emissions Per Year (TONs)
CO_2	78.193888
CO_2e	78.455942

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		21
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, add 1,161 T-7A Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.218131
N_2O	0.042557

Pollutant	Emissions Per Year (TONs)
CO_2	5187.605952
CO_2e	5204.991356

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.218131
N_2O	0.042557

Pollutant	Emissions Per Year (TONs)
CO_2	5187.605952
CO_2e	5204.991356

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1161
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, add 296 T-7A Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.057481
N_2O	0.011215

Pollutant	Emissions Per Year (TONs)
CO_2	1367.013049
CO_2e	1371.594367

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.057481
N_2O	0.011215

Pollutant	Emissions Per Year (TONs)
CO_2	1367.013049
CO_2e	1371.594367

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 296
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, add 584 T-7A Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.107517
N_2O	0.020977

Pollutant	Emissions Per Year (TONs)
CO_2	2556.967121
CO_2e	2565.536374

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.107517
N_2O	0.020977

Pollutant	Emissions Per Year (TONs)
CO_2	2556.967121
CO_2e	2565.536374

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		584
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, add 5 T-38C Destination Cycles in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000498
N_2O	0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	11.852728
CO_2e	11.892450

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000498
N_2O	0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	11.852728
CO_2e	11.892450

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, add 7 T-38C Destination Cycles in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001221
N_2O	0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	29.039184
CO_2e	29.136504

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001221
N_2O	0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	29.039184
CO_2e	29.136504

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		7
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, add 84 T-38C Destination Cycles in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014234
N_2O	0.002777

Pollutant	Emissions Per Year (TONs)
CO_2	338.513912
CO_2e	339.648385

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014234
N_2O	0.002777

Pollutant	Emissions Per Year (TONs)
CO_2	338.513912
CO_2e	339.648385

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 84
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, add 8 T-38C Destination Cycles in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001435
N_2O	0.000280

Pollutant	Emissions Per Year (TONs)
CO_2	34.135857
CO_2e	34.250257

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001435
N_2O	0.000280

Pollutant	Emissions Per Year (TONs)
CO_2	34.135857
CO_2e	34.250257

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 8
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2034, add 10 T-38C Destination Cycles in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001794
N_2O	0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	42.669821
CO_2e	42.812822

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001794
N_2O	0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	42.669821
CO_2e	42.812822

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:
In 2034, add 51 T-38C Destination Cycles in VR-1143 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010421
N_2O	0.002033

Pollutant	Emissions Per Year (TONs)
CO_2	247.840542
CO_2e	248.671139

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010421
N_2O	0.002033

Pollutant	Emissions Per Year (TONs)
CO_2	247.840542
CO_2e	248.671139

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 51
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2034, add 18 T-38C Destination Cycles in VR-1146 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003409
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.072660
CO_2e	81.344361

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003409
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.072660
CO_2e	81.344361

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, add 412 T-38C Destination Cycles in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000665
N_2O	0.000130

Pollutant	Emissions Per Year (TONs)
CO_2	15.804812
CO_2e	15.857779

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000665
N_2O	0.000130

Pollutant	Emissions Per Year (TONs)
CO_2	15.804812
CO_2e	15.857779

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 412
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, add 28 T-38C Destination Cycles in Hollis MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001973
N_2O	0.000385

Pollutant	Emissions Per Year (TONs)
CO_2	46.926872
CO_2e	47.084140

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001973
N_2O	0.000385

Pollutant	Emissions Per Year (TONs)
CO_2	46.926872
CO_2e	47.084140

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 28
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, add 1,519 T-38C Destination Cycles in Westover 1 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.128456
N_2O	0.025062

Pollutant	Emissions Per Year (TONs)
CO_2	3054.939381
CO_2e	3065.177506

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.128456
N_2O	0.025062

Pollutant	Emissions Per Year (TONs)
CO_2	3054.939381
CO_2e	3065.177506

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1519
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, add 388 T-38C Destination Cycles in Westover 2 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.034677
N_2O	0.006766

Pollutant	Emissions Per Year (TONs)
CO_2	824.699616
CO_2e	827.463461

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.034677
N_2O	0.006766

Pollutant	Emissions Per Year (TONs)
CO_2	824.699616
CO_2e	827.463461

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 388
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, add 764 T-38C Destination Cycles in Washita MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055087
N_2O	0.010748

Pollutant	Emissions Per Year (TONs)
CO_2	1310.087899
CO_2e	1314.478442

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055087
N_2O	0.010748

Pollutant	Emissions Per Year (TONs)
CO_2	1310.087899
CO_2e	1314.478442

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 764
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, add 16 T-7A Destination Cycles in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003634
N_2O	0.000709

Pollutant	Emissions Per Year (TONs)
CO_2	86.424540
CO_2e	86.714178

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003634
N_2O	0.000709

Pollutant	Emissions Per Year (TONs)
CO_2	86.424540
CO_2e	86.714178

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		16
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, add 21 T-7A Destination Cycles in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008347
N_2O	0.001628

Pollutant	Emissions Per Year (TONs)
CO_2	198.506365
CO_2e	199.171626

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008347
N_2O	0.001628

Pollutant	Emissions Per Year (TONs)
CO_2	198.506365
CO_2e	199.171626

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 21
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, add 245 T-7A Destination Cycles in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.094598
N_2O	0.018456

Pollutant	Emissions Per Year (TONs)
CO_2	2249.738805
CO_2e	2257.278433

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.094598
N_2O	0.018456

Pollutant	Emissions Per Year (TONs)
CO_2	2249.738805
CO_2e	2257.278433

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		245
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, add 24 T-7A Destination Cycles in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		24
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2035, add 30 T-7A Destination Cycles in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012265
N_2O	0.002393

Pollutant	Emissions Per Year (TONs)
CO_2	291.682822
CO_2e	292.660349

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012265
N_2O	0.002393

Pollutant	Emissions Per Year (TONs)
CO_2	291.682822
CO_2e	292.660349

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 30
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:

In 2035, add 151 T-7A Destination Cycles in VR-1143 with 76 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070307
N_2O	0.013717

Pollutant	Emissions Per Year (TONs)
CO_2	1672.044771
CO_2e	1677.648353

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.070307
N_2O	0.013717

Pollutant	Emissions Per Year (TONs)
CO_2	1672.044771
CO_2e	1677.648353

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 151
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2035, add 54 T-7A Destination Cycles in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.023303
N_2O	0.004546

Pollutant	Emissions Per Year (TONs)
CO_2	554.197362
CO_2e	556.054663

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.023303
N_2O	0.004546

Pollutant	Emissions Per Year (TONs)
CO_2	554.197362
CO_2e	556.054663

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		54
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, add 1,207 T-7A Destination Cycles in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005389
N_2O	0.001051

Pollutant	Emissions Per Year (TONs)
CO_2	128.170402
CO_2e	128.599944

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005389
N_2O	0.001051

Pollutant	Emissions Per Year (TONs)
CO_2	128.170402
CO_2e	128.599944

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1207
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, add 81 T-7A Destination Cycles in Hollis MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012682
N_2O	0.002474

Pollutant	Emissions Per Year (TONs)
CO_2	301.604997
CO_2e	302.615777

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.012682
N_2O	0.002474

Pollutant	Emissions Per Year (TONs)
CO_2	301.604997
CO_2e	302.615777

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 81
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, add 4,449 T-7A Destination Cycles in Westover 1 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.835888
N_2O	0.163082

Pollutant	Emissions Per Year (TONs)
CO_2	19879.120482
CO_2e	19945.742071

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.835888
N_2O	0.163082

Pollutant	Emissions Per Year (TONs)
CO_2	19879.120482
CO_2e	19945.742071

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4449
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2035, add 1,136 T-7A Destination Cycles in Westover 2 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.220602
N_2O	0.043040

Pollutant	Emissions Per Year (TONs)
CO_2	5246.374404
CO_2e	5263.956761

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.220602
N_2O	0.043040

Pollutant	Emissions Per Year (TONs)
CO_2	5246.374404
CO_2e	5263.956761

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1136
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, add 2,238 T-7A Destination Cycles in Washita MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.412025
N_2O	0.080386

Pollutant	Emissions Per Year (TONs)
CO_2	9798.788386
CO_2e	9831.627407

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.412025
N_2O	0.080386

Pollutant	Emissions Per Year (TONs)
CO_2	9798.788386
CO_2e	9831.627407

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2238
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, remove 18 T-38C Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, remove 24 T-38C Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004186
N_2O	-0.000817

Pollutant	Emissions Per Year (TONs)
CO_2	-99.562915
CO_2e	-99.896584

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004186
N_2O	-0.000817

Pollutant	Emissions Per Year (TONs)
CO_2	-99.562915
CO_2e	-99.896584

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 24
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, remove 280 T-38C Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.047447
N_2O	-0.009257

Pollutant	Emissions Per Year (TONs)
CO_2	-1128.379706
CO_2e	-1132.161284

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.047447
N_2O	-0.009257

Pollutant	Emissions Per Year (TONs)
CO_2	-1128.379706
CO_2e	-1132.161284

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 280
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0

Military (mins): 0
AfterBurn (mins): 0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, remove 28 T-38C Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 28
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2035, remove 34 T-38C Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006100
N_2O	-0.001190

Pollutant	Emissions Per Year (TONs)
CO_2	-145.077391
CO_2e	-145.563594

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006100
N_2O	-0.001190

Pollutant	Emissions Per Year (TONs)
CO_2	-145.077391
CO_2e	-145.563594

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 34
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo

Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2035, remove 172 T-38C Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035146
N_2O	-0.006857

Pollutant	Emissions Per Year (TONs)
CO_2	-835.854379
CO_2e	-838.655606

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035146
N_2O	-0.006857

Pollutant	Emissions Per Year (TONs)
CO_2	-835.854379
CO_2e	-838.655606

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 172
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2035, remove 62 T-38C Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.011742
N_2O	-0.002291

Pollutant	Emissions Per Year (TONs)
CO_2	-279.250272
CO_2e	-280.186133

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.011742
N_2O	-0.002291

Pollutant	Emissions Per Year (TONs)
CO_2	-279.250272
CO_2e	-280.186133

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 62
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 1,377 T-38C Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002221
N_2O	-0.000433

Pollutant	Emissions Per Year (TONs)
CO_2	-52.823364
CO_2e	-53.000393

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002221
N_2O	-0.000433

Pollutant	Emissions Per Year (TONs)
CO_2	-52.823364
CO_2e	-53.000393

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1377
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, remove 92 T-38C Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006483
N_2O	-0.001265

Pollutant	Emissions Per Year (TONs)
CO_2	-154.188294
CO_2e	-154.705031

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006483
N_2O	-0.001265

Pollutant	Emissions Per Year (TONs)
CO_2	-154.188294
CO_2e	-154.705031

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		92
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, remove 5,078 T-38C Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.429426
N_2O	-0.083781

Pollutant	Emissions Per Year (TONs)
CO_2	-10212.628162
CO_2e	-10246.854098

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.429426
N_2O	-0.083781

Pollutant	Emissions Per Year (TONs)
CO_2	-10212.628162
CO_2e	-10246.854098

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		5078
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2035, remove 1,847 T-38C Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.165075
N_2O	-0.032206

Pollutant	Emissions Per Year (TONs)
CO_2	-3925.825234
CO_2e	-3938.981989

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.165075
N_2O	-0.032206

Pollutant	Emissions Per Year (TONs)
CO_2	-3925.825234
CO_2e	-3938.981989

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1847
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, remove 2,554 T-38C Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.184153
N_2O	-0.035928

Pollutant	Emissions Per Year (TONs)
CO_2	-4379.534677
CO_2e	-4394.211964

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.184153
N_2O	-0.035928

Pollutant	Emissions Per Year (TONs)
CO_2	-4379.534677
CO_2e	-4394.211964

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2554
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, add 15 T-7A Destination Cycles in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003407
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.023006
CO_2e	81.294541

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003407
N_2O	0.000665

Pollutant	Emissions Per Year (TONs)
CO_2	81.023006
CO_2e	81.294541

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		15
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, add 20 T-7A Destination Cycles in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007949
N_2O	0.001551

Pollutant	Emissions Per Year (TONs)
CO_2	189.053681
CO_2e	189.687263

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007949
N_2O	0.001551

Pollutant	Emissions Per Year (TONs)
CO_2	189.053681
CO_2e	189.687263

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		20
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, add 229 T-7A Destination Cycles in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.088420
N_2O	0.017251

Pollutant	Emissions Per Year (TONs)
CO_2	2102.817088
CO_2e	2109.864332

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.088420
N_2O	0.017251

Pollutant	Emissions Per Year (TONs)
CO_2	2102.817088
CO_2e	2109.864332

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 229
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, add 23 T-7A Destination Cycles in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009403
N_2O	0.001835

Pollutant	Emissions Per Year (TONs)
CO_2	223.623497
CO_2e	224.372934

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009403
N_2O	0.001835

Pollutant	Emissions Per Year (TONs)
CO_2	223.623497
CO_2e	224.372934

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2036, add 28 T-7A Destination Cycles in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011447
N_2O	0.002233

Pollutant	Emissions Per Year (TONs)
CO_2	272.237301
CO_2e	273.149659

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011447
N_2O	0.002233

Pollutant	Emissions Per Year (TONs)
CO_2	272.237301
CO_2e	273.149659

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		28
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2036, add 141 T-7A Destination Cycles in VR-1143 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.065651
N_2O	0.012809

Pollutant	Emissions Per Year (TONs)
CO_2	1561.313329
CO_2e	1566.545813

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.065651
N_2O	0.012809

Pollutant	Emissions Per Year (TONs)
CO_2	1561.313329
CO_2e	1566.545813

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		141
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2036, add 50 T-7A Destination Cycles in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 50
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, add 1,128 T-7A Destination Cycles in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005037
N_2O	0.000983

Pollutant	Emissions Per Year (TONs)
CO_2	119.781452
CO_2e	120.182880

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005037
N_2O	0.000983

Pollutant	Emissions Per Year (TONs)
CO_2	119.781452
CO_2e	120.182880

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1128
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, add 75 T-7A Destination Cycles in Hollis MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011743
N_2O	0.002291

Pollutant	Emissions Per Year (TONs)
CO_2	279.263886
CO_2e	280.199793

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.011743
N_2O	0.002291

Pollutant	Emissions Per Year (TONs)
CO_2	279.263886
CO_2e	280.199793

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		75
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, add 4,159 T-7A Destination Cycles in Westover 1 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.781402
N_2O	0.152452

Pollutant	Emissions Per Year (TONs)
CO_2	18583.336050
CO_2e	18645.615031

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.781402
N_2O	0.152452

Pollutant	Emissions Per Year (TONs)
CO_2	18583.336050
CO_2e	18645.615031

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4159
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, add 1,062 T-7A Destination Cycles in Westover 2 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.206232
N_2O	0.040236

Pollutant	Emissions Per Year (TONs)
CO_2	4904.621142
CO_2e	4921.058169

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.206232
N_2O	0.040236

Pollutant	Emissions Per Year (TONs)
CO_2	4904.621142
CO_2e	4921.058169

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1062
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, add 2,092 T-7A Destination Cycles in Washita MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.385146
N_2O	0.075142

Pollutant	Emissions Per Year (TONs)
CO_2	9159.546606
CO_2e	9190.243313

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.385146
N_2O	0.075142

Pollutant	Emissions Per Year (TONs)
CO_2	9159.546606
CO_2e	9190.243313

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		2092
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, remove 18 T-38C Destination Cycles in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001794
N_2O	-0.000350

Pollutant	Emissions Per Year (TONs)
CO_2	-42.669821
CO_2e	-42.812822

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, remove 25 T-38C Destination Cycles in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004361
N_2O	-0.000851

Pollutant	Emissions Per Year (TONs)
CO_2	-103.711370
CO_2e	-104.058942

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004361
N_2O	-0.000851

Pollutant	Emissions Per Year (TONs)
CO_2	-103.711370
CO_2e	-104.058942

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		25
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, remove 287 T-38C Destination Cycles in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.048633
N_2O	-0.009488

Pollutant	Emissions Per Year (TONs)
CO_2	-1156.589198
CO_2e	-1160.465316

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.048633
N_2O	-0.009488

Pollutant	Emissions Per Year (TONs)
CO_2	-1156.589198
CO_2e	-1160.465316

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 287
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, remove 28 T-38C Destination Cycles in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 28
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

66. Aircraft

66.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:

In 2036, remove 35 T-38C Destination Cycles in VR-1142 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006280
N_2O	-0.001225

Pollutant	Emissions Per Year (TONs)
CO_2	-149.344373
CO_2e	-149.844876

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006280
N_2O	-0.001225

Pollutant	Emissions Per Year (TONs)
CO_2	-149.344373
CO_2e	-149.844876

66.2 Aircraft & Engines

66.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

66.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

66.3 Flight Operations

66.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 35
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

66.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

67. Aircraft

67.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2036, remove 176 T-38C Destination Cycles in VR-1143 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035964
N_2O	-0.007017

Pollutant	Emissions Per Year (TONs)
CO_2	-855.292852
CO_2e	-858.159225

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.035964
N_2O	-0.007017

Pollutant	Emissions Per Year (TONs)
CO_2	-855.292852
CO_2e	-858.159225

67.2 Aircraft & Engines

67.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

67.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

67.3 Flight Operations

67.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 176
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

67.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

68. Aircraft

68.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2036, remove 63 T-38C Destination Cycles in VR-1146 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.011931
N_2O	-0.002328

Pollutant	Emissions Per Year (TONs)
CO_2	-283.754308
CO_2e	-284.705264

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.011931
N_2O	-0.002328

Pollutant	Emissions Per Year (TONs)
CO_2	-283.754308
CO_2e	-284.705264

68.2 Aircraft & Engines

68.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

68.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

68.3 Flight Operations

68.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 63
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

68.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

69. Aircraft

69.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 1,410 T-38C Destination Cycles in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002274
N_2O	-0.000444

Pollutant	Emissions Per Year (TONs)
CO_2	-54.089284
CO_2e	-54.270555

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002274
N_2O	-0.000444

Pollutant	Emissions Per Year (TONs)
CO_2	-54.089284
CO_2e	-54.270555

69.2 Aircraft & Engines

69.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

69.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

69.3 Flight Operations

69.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1410
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

69.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

70. Aircraft

70.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, remove 94 T-38C Destination Cycles in Hollis MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006624
N_2O	-0.001292

Pollutant	Emissions Per Year (TONs)
CO_2	-157.540214
CO_2e	-158.068184

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.006624
N_2O	-0.001292

Pollutant	Emissions Per Year (TONs)
CO_2	-157.540214
CO_2e	-158.068184

70.2 Aircraft & Engines

70.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

70.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

70.3 Flight Operations

70.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 94
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

70.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

71. Aircraft

71.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, remove 5,199 T-38C Destination Cycles in Westover 1 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.439659
N_2O	-0.085778

Pollutant	Emissions Per Year (TONs)
CO_2	-10455.977514
CO_2e	-10491.018995

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.439659
N_2O	-0.085778

Pollutant	Emissions Per Year (TONs)
CO_2	-10455.977514
CO_2e	-10491.018995

71.2 Aircraft & Engines

71.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

71.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

71.3 Flight Operations

71.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5199
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

71.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

72. Aircraft

72.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, remove 778 T-38C Destination Cycles in Westover 2 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.069534
N_2O	-0.013566

Pollutant	Emissions Per Year (TONs)
CO_2	-1653.650261
CO_2e	-1659.192197

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.069534
N_2O	-0.013566

Pollutant	Emissions Per Year (TONs)
CO_2	-1653.650261
CO_2e	-1659.192197

72.2 Aircraft & Engines

72.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

72.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

72.3 Flight Operations

72.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 778
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

72.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

73. Aircraft

73.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, remove 2,615 T-38C Destination Cycles in Washita MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.188551
N_2O	-0.036786

Pollutant	Emissions Per Year (TONs)
CO_2	-4484.135936
CO_2e	-4499.163777

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.188551
N_2O	-0.036786

Pollutant	Emissions Per Year (TONs)
CO_2	-4484.135936
CO_2e	-4499.163777

73.2 Aircraft & Engines

73.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

73.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

73.3 Flight Operations

73.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2615
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

73.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

74. Aircraft

74.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, add 2 T-7A Destination Cycles in IR-103 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000454
N_2O	0.000089

Pollutant	Emissions Per Year (TONs)
CO_2	10.803067
CO_2e	10.839272

74.2 Aircraft & Engines

74.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

74.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

74.3 Flight Operations

74.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		2
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

74.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

75. Aircraft

75.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, add 3 T-7A Destination Cycles in VR-158 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001192
N_2O	0.000233

Pollutant	Emissions Per Year (TONs)
CO_2	28.358052
CO_2e	28.453089

75.2 Aircraft & Engines

75.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

75.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

75.3 Flight Operations

75.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

75.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

76. Aircraft

76.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, add 37 T-7A Destination Cycles in VR-159 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014286
N_2O	0.002787

Pollutant	Emissions Per Year (TONs)
CO_2	339.756473
CO_2e	340.895110

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014286
N_2O	0.002787

Pollutant	Emissions Per Year (TONs)
CO_2	339.756473
CO_2e	340.895110

76.2 Aircraft & Engines

76.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

76.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

76.3 Flight Operations

76.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		37
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

76.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

77. Aircraft

77.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, add 4 T-7A Destination Cycles in VR-1141 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001635
N_2O	0.000319

Pollutant	Emissions Per Year (TONs)
CO_2	38.891043
CO_2e	39.021380

77.2 Aircraft & Engines

77.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

77.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

77.3 Flight Operations

77.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

77.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

78. Aircraft

78.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, add 5 T-7A Destination Cycles in VR-1142 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

78.2 Aircraft & Engines

78.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

78.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

78.3 Flight Operations

78.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

78.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

79. Aircraft

79.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:

In 2037, add 23 T-7A Destination Cycles in VR-1143 with 108 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2037

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010709
N_2O	0.002089

Pollutant	Emissions Per Year (TONs)
CO_2	254.682316
CO_2e	255.535842

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010709
N_2O	0.002089

Pollutant	Emissions Per Year (TONs)
CO_2	254.682316
CO_2e	255.535842

79.2 Aircraft & Engines

79.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

79.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

79.3 Flight Operations

79.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

79.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

80. Aircraft

80.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2037, add 8 T-7A Destination Cycles in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

80.2 Aircraft & Engines

80.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

80.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

80.3 Flight Operations

80.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		8
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

80.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

81. Aircraft

81.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, add 184 T-7A Destination Cycles in R-5601 Falcon Range with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000822
N_2O	0.000160

Pollutant	Emissions Per Year (TONs)
CO_2	19.538818
CO_2e	19.604300

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000822
N_2O	0.000160

Pollutant	Emissions Per Year (TONs)
CO_2	19.538818
CO_2e	19.604300

81.2 Aircraft & Engines

81.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

81.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

81.3 Flight Operations

81.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		184
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

81.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

82. Aircraft

82.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, add 12 T-7A Destination Cycles in Hollis MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001879
N_2O	0.000367

Pollutant	Emissions Per Year (TONs)
CO_2	44.682222
CO_2e	44.831967

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001879
N_2O	0.000367

Pollutant	Emissions Per Year (TONs)
CO_2	44.682222
CO_2e	44.831967

82.2 Aircraft & Engines

82.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

82.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

82.3 Flight Operations

82.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 12
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

82.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

83. Aircraft

83.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, add 677 T-7A Destination Cycles in Westover 1 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.127196
N_2O	0.024816

Pollutant	Emissions Per Year (TONs)
CO_2	3024.986416
CO_2e	3035.124159

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.127196
N_2O	0.024816

Pollutant	Emissions Per Year (TONs)
CO_2	3024.986416
CO_2e	3035.124159

83.2 Aircraft & Engines

83.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

83.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

83.3 Flight Operations

83.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		677
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

83.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

84. Aircraft

84.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, add 173 T-7A Destination Cycles in Westover 2 MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.033595
N_2O	0.006554

Pollutant	Emissions Per Year (TONs)
CO_2	798.963708
CO_2e	801.641303

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.033595
N_2O	0.006554

Pollutant	Emissions Per Year (TONs)
CO_2	798.963708
CO_2e	801.641303

84.2 Aircraft & Engines

84.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

84.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

84.3 Flight Operations

84.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		173
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

84.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

85. Aircraft

85.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, add 341 T-7A Destination Cycles in Washita MOA with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.062779
N_2O	0.012248

Pollutant	Emissions Per Year (TONs)
CO_2	1493.023610
CO_2e	1498.027232

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.062779
N_2O	0.012248

Pollutant	Emissions Per Year (TONs)
CO_2	1493.023610
CO_2e	1498.027232

85.2 Aircraft & Engines

85.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

85.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

85.3 Flight Operations

85.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 341
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

85.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

86. Aircraft

86.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, remove 7 T-38C Destination Cycles in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001221
N_2O	-0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	-29.039184
CO_2e	-29.136504

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001221
N_2O	-0.000238

Pollutant	Emissions Per Year (TONs)
CO_2	-29.039184
CO_2e	-29.136504

86.2 Aircraft & Engines

86.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

86.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

86.3 Flight Operations

86.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

86.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

87. Aircraft

87.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, remove 76 T-38C Destination Cycles in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012878
N_2O	-0.002513

Pollutant	Emissions Per Year (TONs)
CO_2	-306.274492
CO_2e	-307.300920

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012878
N_2O	-0.002513

Pollutant	Emissions Per Year (TONs)
CO_2	-306.274492
CO_2e	-307.300920

87.2 Aircraft & Engines

87.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

87.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

87.3 Flight Operations

87.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 76
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

87.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)

$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

88. Aircraft

88.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, remove 7 T-38C Destination Cycles in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

88.2 Aircraft & Engines

88.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

88.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

88.3 Flight Operations

88.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

88.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

89. Aircraft

89.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, remove 9 T-38C Destination Cycles in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001615
N_2O	-0.000315

Pollutant	Emissions Per Year (TONs)
CO_2	-38.402839
CO_2e	-38.531539

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001615
N_2O	-0.000315

Pollutant	Emissions Per Year (TONs)
CO_2	-38.402839
CO_2e	-38.531539

89.2 Aircraft & Engines

89.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

89.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

89.3 Flight Operations

89.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

89.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

90. Aircraft

90.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:
In 2037, remove 47 T-38C Destination Cycles in VR-1143 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009604
N_2O	-0.001874

Pollutant	Emissions Per Year (TONs)
CO_2	-228.402069
CO_2e	-229.167520

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009604
N_2O	-0.001874

Pollutant	Emissions Per Year (TONs)
CO_2	-228.402069
CO_2e	-229.167520

90.2 Aircraft & Engines

90.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

90.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

90.3 Flight Operations

90.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 47
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

90.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

91. Aircraft

91.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2037, remove 17 T-38C Destination Cycles in VR-1146 with 47 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2037

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003220
N_2O	-0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	-76.568623
CO_2e	-76.825230

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003220
N_2O	-0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	-76.568623
CO_2e	-76.825230

91.2 Aircraft & Engines

91.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

91.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

91.3 Flight Operations

91.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 17
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

91.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

92. Aircraft

92.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 374 T-38C Destination Cycles in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000603
N_2O	-0.000118

Pollutant	Emissions Per Year (TONs)
CO_2	-14.347087
CO_2e	-14.395168

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000603
N_2O	-0.000118

Pollutant	Emissions Per Year (TONs)
CO_2	-14.347087
CO_2e	-14.395168

92.2 Aircraft & Engines

92.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

92.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

92.3 Flight Operations

92.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 374
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

92.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

93. Aircraft

93.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, remove 25 T-38C Destination Cycles in Hollis MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001762
N_2O	-0.000344

Pollutant	Emissions Per Year (TONs)
CO_2	-41.898993
CO_2e	-42.039411

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001762
N_2O	-0.000344

Pollutant	Emissions Per Year (TONs)
CO_2	-41.898993
CO_2e	-42.039411

93.2 Aircraft & Engines

93.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

93.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

93.3 Flight Operations

93.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 25
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

93.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

94. Aircraft

94.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, remove 1,378 T-38C Destination Cycles in Westover 1 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes

End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.116532
N_2O	-0.022735

Pollutant	Emissions Per Year (TONs)
CO_2	-2771.366996
CO_2e	-2780.654775

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.116532
N_2O	-0.022735

Pollutant	Emissions Per Year (TONs)
CO_2	-2771.366996
CO_2e	-2780.654775

94.2 Aircraft & Engines

94.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

94.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

94.3 Flight Operations

94.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1378
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

94.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

95. Aircraft

95.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, remove 352 T-38C Destination Cycles in Westover 2 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.031460
N_2O	-0.006138

Pollutant	Emissions Per Year (TONs)
CO_2	-748.181095
CO_2e	-750.688500

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.031460
N_2O	-0.006138

Pollutant	Emissions Per Year (TONs)
CO_2	-748.181095
CO_2e	-750.688500

95.2 Aircraft & Engines

95.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

95.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

95.3 Flight Operations

95.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		352
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

95.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

96. Aircraft

96.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, remove 693 T-38C Destination Cycles in Washita MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.049968
N_2O	-0.009749

Pollutant	Emissions Per Year (TONs)
CO_2	-1188.338893
CO_2e	-1192.321414

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.049968
N_2O	-0.009749

Pollutant	Emissions Per Year (TONs)
CO_2	-1188.338893
CO_2e	-1192.321414

96.2 Aircraft & Engines

96.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

96.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

96.3 Flight Operations

96.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		693
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

96.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

97. Aircraft

97.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, remove 5 T-38C Destination Cycles in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000498
N_2O	-0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	-11.852728
CO_2e	-11.892450

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000498
N_2O	-0.000097

Pollutant	Emissions Per Year (TONs)
CO_2	-11.852728
CO_2e	-11.892450

97.2 Aircraft & Engines

97.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

97.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

97.3 Flight Operations

97.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

97.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: Alternative 3 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, SUA Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-

site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
__X__ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.666	250	No
NOx	10.872	250	No
CO	-3.467	250	No
SOx	0.223	250	No
PM 10	-0.095	250	No
PM 2.5	-0.086	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2035

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.139	250	No
NOx	52.841	250	No
CO	-21.591	250	No
SOx	0.931	250	No
PM 10	-0.630	250	No
PM 2.5	-0.568	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2036

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.719	250	No
NOx	96.526	250	No
CO	-40.156	250	No
SOx	1.677	250	No
PM 10	-1.177	250	No
PM 2.5	-1.061	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2037

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.198	250	No
NOx	119.616	250	No
CO	-44.398	250	No
SOx	2.251	250	No
PM 10	-1.265	250	No
PM 2.5	-1.142	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.198	250	No
NOx	119.616	250	No
CO	-44.398	250	No
SOx	2.251	250	No
PM 10	-1.265	250	No
PM 2.5	-1.142	250	No
Pb	0.000	25	No
NH3	0.000	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Carolyn Hein, Contractor	May 12 2025
Name, Title	**Date**

SUA ROI: Alternative 3 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB

State(s): Texas, Oklahoma

County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, SUA Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (IR-103)
3.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-158)
4.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-159)
5.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1142)
7.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
10.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (IR-103)
11.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-158)
12.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-159)
13.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1141)
14.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1142)
15.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1143)
16.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)
17.	Aircraft	2034: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
18.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (IR-103)
19.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-158)
20.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-159)
21.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1141)
22.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1142)
23.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1143)
24.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
25.	Aircraft	2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
26.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (IR-103)
27.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-158)
28.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-159)
29.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)
30.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)
31.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)
32.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

33.	Aircraft	2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
34.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (IR-103)
35.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-158)
36.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-159)
37.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1141)
38.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1142)
39.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1143)
40.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
41.	Aircraft	2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
42.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (IR-103)
43.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-158)
44.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-159)
45.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)
46.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)
47.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)
48.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
49.	Aircraft	2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
50.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (IR-103)
51.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-158)
52.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-159)
53.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1141)
54.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1142)
55.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1143)
56.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
57.	Aircraft	2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)
58.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-158)
59.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-159)
60.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)
61.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)
62.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)
63.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)
64.	Aircraft	2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)
65.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, add 3 T-7A Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.011483
SO_x	0.005413
NO_x	0.166931
CO	0.009510

Pollutant	Emissions Per Year (TONs)
PM 10	0.000809
PM 2.5	0.000708
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.011483
SO_x	0.005413
NO_x	0.166931
CO	0.009510

Pollutant	Emissions Per Year (TONs)
PM 10	0.000809
PM 2.5	0.000708
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, add 4 T-7A Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, add 51 T-7A Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.331853
SO_x	0.156424
NO_x	4.824291
CO	0.274838

Pollutant	Emissions Per Year (TONs)
PM 10	0.023391
PM 2.5	0.020467
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.331853
SO_x	0.156424
NO_x	4.824291
CO	0.274838

Pollutant	Emissions Per Year (TONs)
PM 10	0.023391
PM 2.5	0.020467
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 51
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, add 5 T-7A Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.034448
SO_x	0.016238
NO_x	0.500792
CO	0.028530

Pollutant	Emissions Per Year (TONs)
PM 10	0.002428
PM 2.5	0.002125
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		5
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:

In 2034, add 6 T-7A Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.041338
SO_x	0.019485
NO_x	0.600950
CO	0.034236

Pollutant	Emissions Per Year (TONs)
PM 10	0.002914
PM 2.5	0.002549
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		6
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2034, add 31 T-7A Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.243244
SO_x	0.114657
NO_x	3.536144
CO	0.201453

Pollutant	Emissions Per Year (TONs)
PM 10	0.017145
PM 2.5	0.015002
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.243244
SO_x	0.114657
NO_x	3.536144
CO	0.201453

Pollutant	Emissions Per Year (TONs)
PM 10	0.017145
PM 2.5	0.015002
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 31
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 10 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		10
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, add 101 T-7A Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.006440
SO_x	0.003582
NO_x	0.045751
CO	0.010157

Pollutant	Emissions Per Year (TONs)
PM 10	0.000386
PM 2.5	0.000327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000451
N_2O	0.000088

Pollutant	Emissions Per Year (TONs)
CO_2	10.725112
CO_2e	10.761056

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.006440
SO_x	0.003582
NO_x	0.045751
CO	0.010157

Pollutant	Emissions Per Year (TONs)
PM 10	0.000386
PM 2.5	0.000327
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000451
N_2O	0.000088

Pollutant	Emissions Per Year (TONs)
CO_2	10.725112
CO_2e	10.761056

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		101
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2034, remove 3 T-38C Low-Altitude Operations in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.001665
SO_x	-0.002375
NO_x	-0.004262
CO	-0.068798

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002509
PM 2.5	-0.002242
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.001665
SO_x	-0.002375
NO_x	-0.004262
CO	-0.068798

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002509
PM 2.5	-0.002242
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2034, remove 4 T-38C Low-Altitude Operations in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003885
SO_x	-0.005543
NO_x	-0.009946
CO	-0.160528

Pollutant	Emissions Per Year (TONs)
PM 10	-0.005853
PM 2.5	-0.005232
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003885
SO_x	-0.005543
NO_x	-0.009946
CO	-0.160528

Pollutant	Emissions Per Year (TONs)
PM 10	-0.005853
PM 2.5	-0.005232
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2034, remove 45 T-38C Low-Altitude Operations in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042458
SO_x	-0.060573
NO_x	-0.108691
CO	-1.754344

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063969
PM 2.5	-0.057176
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042458
SO_x	-0.060573
NO_x	-0.108691
CO	-1.754344

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063969
PM 2.5	-0.057176
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2034, remove 4 T-38C Low-Altitude Operations in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003996
SO_x	-0.005701
NO_x	-0.010230
CO	-0.165115

Pollutant	Emissions Per Year (TONs)
PM 10	-0.006021
PM 2.5	-0.005381
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.003996
SO_x	-0.005701
NO_x	-0.010230
CO	-0.165115

Pollutant	Emissions Per Year (TONs)
PM 10	-0.006021
PM 2.5	-0.005381
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:

In 2034, remove 5 T-38C Low-Altitude Operations in VR-1142 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004995
SO_x	-0.007126
NO_x	-0.012787
CO	-0.206393

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007526
PM 2.5	-0.006727
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004995
SO_x	-0.007126
NO_x	-0.012787
CO	-0.206393

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007526
PM 2.5	-0.006727
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:

In 2034, remove 27 T-38C Low-Altitude Operations in VR-1143 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.030719
SO_x	-0.043826
NO_x	-0.078641
CO	-1.269319

Pollutant	Emissions Per Year (TONs)
PM 10	-0.046284
PM 2.5	-0.041369
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.030719
SO_x	-0.043826
NO_x	-0.078641
CO	-1.269319

Pollutant	Emissions Per Year (TONs)
PM 10	-0.046284
PM 2.5	-0.041369
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2034, remove 9 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2034, remove 89 T-38C Low-Altitude Operations in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005080
SO_x	-0.001140
NO_x	-0.000803
CO	-0.091491

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002165
PM 2.5	-0.001945
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000144
N_2O	-0.000028

Pollutant	Emissions Per Year (TONs)
CO_2	-3.414146
CO_2e	-3.425588

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005080
SO_x	-0.001140
NO_x	-0.000803
CO	-0.091491

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002165
PM 2.5	-0.001945
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000144
N_2O	-0.000028

Pollutant	Emissions Per Year (TONs)
CO_2	-3.414146
CO_2e	-3.425588

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 89
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, add 13 T-7A Low-Altitude Operations in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, add 16 T-7A Low-Altitude Operations in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		16
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, add 196 T-7A Low-Altitude Operations in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.275356
SO_x	0.601159
NO_x	18.540414
CO	1.056242

Pollutant	Emissions Per Year (TONs)
PM 10	0.089893
PM 2.5	0.078656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.275356
SO_x	0.601159
NO_x	18.540414
CO	1.056242

Pollutant	Emissions Per Year (TONs)
PM 10	0.089893
PM 2.5	0.078656
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 196
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, add 19 T-7A Low-Altitude Operations in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 19
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, add 24 T-7A Low-Altitude Operations in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.165352
SO_x	0.077941
NO_x	2.403799
CO	0.136944

Pollutant	Emissions Per Year (TONs)
PM 10	0.011655
PM 2.5	0.010198
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.165352
SO_x	0.077941
NO_x	2.403799
CO	0.136944

Pollutant	Emissions Per Year (TONs)
PM 10	0.011655
PM 2.5	0.010198
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		24
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, add 120 T-7A Low-Altitude Operations in VR-1143 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.941589
SO_x	0.443833
NO_x	13.688301
CO	0.779818

Pollutant	Emissions Per Year (TONs)
PM 10	0.066368
PM 2.5	0.058072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.941589
SO_x	0.443833
NO_x	13.688301
CO	0.779818

Pollutant	Emissions Per Year (TONs)
PM 10	0.066368
PM 2.5	0.058072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		120
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 40 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 40
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, add 389 T-7A Low-Altitude Operations in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.024804
SO_x	0.013797
NO_x	0.176211
CO	0.039118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001488
PM 2.5	0.001261
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001737
N_2O	0.000339

Pollutant	Emissions Per Year (TONs)
CO_2	41.307611
CO_2e	41.446046

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.024804
SO_x	0.013797
NO_x	0.176211
CO	0.039118

Pollutant	Emissions Per Year (TONs)
PM 10	0.001488
PM 2.5	0.001261
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001737
N_2O	0.000339

Pollutant	Emissions Per Year (TONs)
CO_2	41.307611
CO_2e	41.446046

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 389
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2035, remove 14 T-38C Low-Altitude Operations in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.007770
SO_x	-0.011085
NO_x	-0.019891
CO	-0.321056

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011707
PM 2.5	-0.010464
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.007770
SO_x	-0.011085
NO_x	-0.019891
CO	-0.321056

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011707
PM 2.5	-0.010464
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 14
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2035, remove 18 T-38C Low-Altitude Operations in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2035, remove 224 T-38C Low-Altitude Operations in VR-159 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.211344
SO_x	-0.301517
NO_x	-0.541041
CO	-8.732734

Pollutant	Emissions Per Year (TONs)
PM 10	-0.318425
PM 2.5	-0.284610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.211344
SO_x	-0.301517
NO_x	-0.541041
CO	-8.732734

Pollutant	Emissions Per Year (TONs)
PM 10	-0.318425
PM 2.5	-0.284610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01

After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 224
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2035, remove 21 T-38C Low-Altitude Operations in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A

End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.020979
SO_x	-0.029930
NO_x	-0.053706
CO	-0.866852

Pollutant	Emissions Per Year (TONs)
PM 10	-0.031608
PM 2.5	-0.028252
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003768
N_2O	-0.000735

Pollutant	Emissions Per Year (TONs)
CO_2	-89.606624
CO_2e	-89.906925

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.020979
SO_x	-0.029930
NO_x	-0.053706
CO	-0.866852

Pollutant	Emissions Per Year (TONs)
PM 10	-0.031608
PM 2.5	-0.028252
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003768
N_2O	-0.000735

Pollutant	Emissions Per Year (TONs)
CO_2	-89.606624
CO_2e	-89.906925

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64

Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 21
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2035, remove 27 T-38C Low-Altitude Operations in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.026973
SO_x	-0.038481
NO_x	-0.069051
CO	-1.114524

Pollutant	Emissions Per Year (TONs)
PM 10	-0.040639
PM 2.5	-0.036324
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		27
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2035, remove 137 T-38C Low-Altitude Operations in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.155872
SO_x	-0.222377
NO_x	-0.399032
CO	-6.440621

Pollutant	Emissions Per Year (TONs)
PM 10	-0.234847
PM 2.5	-0.209907
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.155872
SO_x	-0.222377
NO_x	-0.399032
CO	-6.440621

Pollutant	Emissions Per Year (TONs)
PM 10	-0.234847
PM 2.5	-0.209907
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		137
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, remove 45 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		45
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 444 T-38C Low-Altitude Operations in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025345
SO_x	-0.005689
NO_x	-0.004007
CO	-0.456427

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010802
PM 2.5	-0.009702
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000716
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.032370
CO_2e	-17.089451

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025345
SO_x	-0.005689
NO_x	-0.004007
CO	-0.456427

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010802
PM 2.5	-0.009702
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000716
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.032370
CO_2e	-17.089451

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		444
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, add 13 T-7A Low-Altitude Operations in IR-103 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.049759
SO_x	0.023455
NO_x	0.723366
CO	0.041210

Pollutant	Emissions Per Year (TONs)
PM 10	0.003507
PM 2.5	0.003069
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 13
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, add 16 T-7A Low-Altitude Operations in VR-158 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.107173
SO_x	0.050518
NO_x	1.558018
CO	0.088760

Pollutant	Emissions Per Year (TONs)
PM 10	0.007554
PM 2.5	0.006610
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006360
N_2O	0.001241

Pollutant	Emissions Per Year (TONs)
CO_2	151.242945
CO_2e	151.749811

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		16
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, add 205 T-7A Low-Altitude Operations in VR-159 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	1.333918
SO_x	0.628763
NO_x	19.391760
CO	1.104743

Pollutant	Emissions Per Year (TONs)
PM 10	0.094021
PM 2.5	0.082268
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.079154
N_2O	0.015443

Pollutant	Emissions Per Year (TONs)
CO_2	1882.434511
CO_2e	1888.743179

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	1.333918
SO_x	0.628763
NO_x	19.391760
CO	1.104743

Pollutant	Emissions Per Year (TONs)
PM 10	0.094021
PM 2.5	0.082268
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.079154
N_2O	0.015443

Pollutant	Emissions Per Year (TONs)
CO_2	1882.434511
CO_2e	1888.743179

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		205
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, add 19 T-7A Low-Altitude Operations in VR-1141 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.130904
SO_x	0.061704
NO_x	1.903008
CO	0.108414

Pollutant	Emissions Per Year (TONs)
PM 10	0.009227
PM 2.5	0.008073
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 19
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, add 25 T-7A Low-Altitude Operations in VR-1142 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.172242
SO_x	0.081189
NO_x	2.503958
CO	0.142650

Pollutant	Emissions Per Year (TONs)
PM 10	0.012140
PM 2.5	0.010623
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010221
N_2O	0.001994

Pollutant	Emissions Per Year (TONs)
CO_2	243.069019
CO_2e	243.883624

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.172242
SO_x	0.081189
NO_x	2.503958
CO	0.142650

Pollutant	Emissions Per Year (TONs)
PM 10	0.012140
PM 2.5	0.010623
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010221
N_2O	0.001994

Pollutant	Emissions Per Year (TONs)
CO_2	243.069019
CO_2e	243.883624

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		25
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, add 126 T-7A Low-Altitude Operations in VR-1143 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.988669
SO_x	0.466024
NO_x	14.372716
CO	0.818809

Pollutant	Emissions Per Year (TONs)
PM 10	0.069686
PM 2.5	0.060975
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.058667
N_2O	0.011446

Pollutant	Emissions Per Year (TONs)
CO_2	1395.216167
CO_2e	1399.892003

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.988669
SO_x	0.466024
NO_x	14.372716
CO	0.818809

Pollutant	Emissions Per Year (TONs)
PM 10	0.069686
PM 2.5	0.060975
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.058667
N_2O	0.011446

Pollutant	Emissions Per Year (TONs)
CO_2	1395.216167
CO_2e	1399.892003

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		126
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 41 T-7A Low-Altitude Operations in VR-1146 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.298170
SO_x	0.140547
NO_x	4.334629
CO	0.246942

Pollutant	Emissions Per Year (TONs)
PM 10	0.021016
PM 2.5	0.018389
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017693
N_2O	0.003452

Pollutant	Emissions Per Year (TONs)
CO_2	420.779479
CO_2e	422.189652

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.298170
SO_x	0.140547
NO_x	4.334629
CO	0.246942

Pollutant	Emissions Per Year (TONs)
PM 10	0.021016
PM 2.5	0.018389
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017693
N_2O	0.003452

Pollutant	Emissions Per Year (TONs)
CO_2	420.779479
CO_2e	422.189652

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 41
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, add 406 T-7A Low-Altitude Operations in R-5601 Falcon Range with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.025888
SO_x	0.014400
NO_x	0.183911
CO	0.040828

Pollutant	Emissions Per Year (TONs)
PM 10	0.001553
PM 2.5	0.001316
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001813
N_2O	0.000354

Pollutant	Emissions Per Year (TONs)
CO_2	43.112828
CO_2e	43.257313

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.025888
SO_x	0.014400
NO_x	0.183911
CO	0.040828

Pollutant	Emissions Per Year (TONs)
PM 10	0.001553
PM 2.5	0.001316
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001813
N_2O	0.000354

Pollutant	Emissions Per Year (TONs)
CO_2	43.112828
CO_2e	43.257313

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 406
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2036, remove 15 T-38C Low-Altitude Operations in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008325
SO_x	-0.011877
NO_x	-0.021312
CO	-0.343989

Pollutant	Emissions Per Year (TONs)
PM 10	-0.012543
PM 2.5	-0.011211
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.008325
SO_x	-0.011877
NO_x	-0.021312
CO	-0.343989

Pollutant	Emissions Per Year (TONs)
PM 10	-0.012543
PM 2.5	-0.011211
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2036, remove 18 T-38C Low-Altitude Operations in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.017483
SO_x	-0.024942
NO_x	-0.044755
CO	-0.722377

Pollutant	Emissions Per Year (TONs)
PM 10	-0.026340
PM 2.5	-0.023543
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003140
N_2O	-0.000613

Pollutant	Emissions Per Year (TONs)
CO_2	-74.672186
CO_2e	-74.922438

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 18
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2036, remove 229 T-38C Low-Altitude Operations in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.216062
SO_x	-0.308248
NO_x	-0.553117
CO	-8.927661

Pollutant	Emissions Per Year (TONs)
PM 10	-0.325533
PM 2.5	-0.290963
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.216062
SO_x	-0.308248
NO_x	-0.553117
CO	-8.927661

Pollutant	Emissions Per Year (TONs)
PM 10	-0.325533
PM 2.5	-0.290963
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 229
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2036, remove 22 T-38C Low-Altitude Operations in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021978
SO_x	-0.031355
NO_x	-0.056264
CO	-0.908131

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033114
PM 2.5	-0.029597
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.021978
SO_x	-0.031355
NO_x	-0.056264
CO	-0.908131

Pollutant	Emissions Per Year (TONs)
PM 10	-0.033114
PM 2.5	-0.029597
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2036, remove 28 T-38C Low-Altitude Operations in VR-1142 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.027972
SO_x	-0.039907
NO_x	-0.071608
CO	-1.155803

Pollutant	Emissions Per Year (TONs)
PM 10	-0.042144
PM 2.5	-0.037669
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.027972
SO_x	-0.039907
NO_x	-0.071608
CO	-1.155803

Pollutant	Emissions Per Year (TONs)
PM 10	-0.042144
PM 2.5	-0.037669
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		28
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2036, remove 141 T-38C Low-Altitude Operations in VR-1143 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.160423
SO_x	-0.228870
NO_x	-0.410682
CO	-6.628668

Pollutant	Emissions Per Year (TONs)
PM 10	-0.241704
PM 2.5	-0.216036
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.160423
SO_x	-0.228870
NO_x	-0.410682
CO	-6.628668

Pollutant	Emissions Per Year (TONs)
PM 10	-0.241704
PM 2.5	-0.216036
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		141
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 46 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		46
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 454 T-38C Low-Altitude Operations in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025916
SO_x	-0.005817
NO_x	-0.004098
CO	-0.466707

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011045
PM 2.5	-0.009921
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000732
N_2O	-0.000143

Pollutant	Emissions Per Year (TONs)
CO_2	-17.415982
CO_2e	-17.474349

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025916
SO_x	-0.005817
NO_x	-0.004098
CO	-0.466707

Pollutant	Emissions Per Year (TONs)
PM 10	-0.011045
PM 2.5	-0.009921
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000732
N_2O	-0.000143

Pollutant	Emissions Per Year (TONs)
CO_2	-17.415982
CO_2e	-17.474349

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		454
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, add 7 T-7A Low-Altitude Operations in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.026793
SO_x	0.012629
NO_x	0.389505
CO	0.022190

Pollutant	Emissions Per Year (TONs)
PM 10	0.001889
PM 2.5	0.001652
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, add 8 T-7A Low-Altitude Operations in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.053586
SO_x	0.025259
NO_x	0.779009
CO	0.044380

Pollutant	Emissions Per Year (TONs)
PM 10	0.003777
PM 2.5	0.003305
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003180
N_2O	0.000620

Pollutant	Emissions Per Year (TONs)
CO_2	75.621472
CO_2e	75.874905

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.053586
SO_x	0.025259
NO_x	0.779009
CO	0.044380

Pollutant	Emissions Per Year (TONs)
PM 10	0.003777
PM 2.5	0.003305
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003180
N_2O	0.000620

Pollutant	Emissions Per Year (TONs)
CO_2	75.621472
CO_2e	75.874905

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		8
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, add 107 T-7A Low-Altitude Operations in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.696240
SO_x	0.328184
NO_x	10.121553
CO	0.576622

Pollutant	Emissions Per Year (TONs)
PM 10	0.049074
PM 2.5	0.042940
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.041314
N_2O	0.008060

Pollutant	Emissions Per Year (TONs)
CO_2	982.538989
CO_2e	985.831806

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.696240
SO_x	0.328184
NO_x	10.121553
CO	0.576622

Pollutant	Emissions Per Year (TONs)
PM 10	0.049074
PM 2.5	0.042940
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.041314
N_2O	0.008060

Pollutant	Emissions Per Year (TONs)
CO_2	982.538989
CO_2e	985.831806

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		107
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, add 10 T-7A Low-Altitude Operations in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.068897
SO_x	0.032476
NO_x	1.001583
CO	0.057060

Pollutant	Emissions Per Year (TONs)
PM 10	0.004856
PM 2.5	0.004249
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004088
N_2O	0.000798

Pollutant	Emissions Per Year (TONs)
CO_2	97.227607
CO_2e	97.553450

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.068897
SO_x	0.032476
NO_x	1.001583
CO	0.057060

Pollutant	Emissions Per Year (TONs)
PM 10	0.004856
PM 2.5	0.004249
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004088
N_2O	0.000798

Pollutant	Emissions Per Year (TONs)
CO_2	97.227607
CO_2e	97.553450

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, add 13 T-7A Low-Altitude Operations in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.089566
SO_x	0.042218
NO_x	1.302058
CO	0.074178

Pollutant	Emissions Per Year (TONs)
PM 10	0.006313
PM 2.5	0.005524
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005315
N_2O	0.001037

Pollutant	Emissions Per Year (TONs)
CO_2	126.395890
CO_2e	126.819485

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.089566
SO_x	0.042218
NO_x	1.302058
CO	0.074178

Pollutant	Emissions Per Year (TONs)
PM 10	0.006313
PM 2.5	0.005524
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005315
N_2O	0.001037

Pollutant	Emissions Per Year (TONs)
CO_2	126.395890
CO_2e	126.819485

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, add 65 T-7A Low-Altitude Operations in VR-1143 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.510027
SO_x	0.240409
NO_x	7.414496
CO	0.422402

Pollutant	Emissions Per Year (TONs)
PM 10	0.035949
PM 2.5	0.031455
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.030265
N_2O	0.005905

Pollutant	Emissions Per Year (TONs)
CO_2	719.754372
CO_2e	722.166510

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.510027
SO_x	0.240409
NO_x	7.414496
CO	0.422402

Pollutant	Emissions Per Year (TONs)
PM 10	0.035949
PM 2.5	0.031455
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.030265
N_2O	0.005905

Pollutant	Emissions Per Year (TONs)
CO_2	719.754372
CO_2e	722.166510

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		65
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 22 T-7A Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.159994
SO_x	0.075415
NO_x	2.325898
CO	0.132506

Pollutant	Emissions Per Year (TONs)
PM 10	0.011277
PM 2.5	0.009867
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009494
N_2O	0.001852

Pollutant	Emissions Per Year (TONs)
CO_2	225.784111
CO_2e	226.540789

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.159994
SO_x	0.075415
NO_x	2.325898
CO	0.132506

Pollutant	Emissions Per Year (TONs)
PM 10	0.011277
PM 2.5	0.009867
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009494
N_2O	0.001852

Pollutant	Emissions Per Year (TONs)
CO_2	225.784111
CO_2e	226.540789

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, add 211 T-7A Low-Altitude Operations in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.013454
SO_x	0.007484
NO_x	0.095580
CO	0.021218

Pollutant	Emissions Per Year (TONs)
PM 10	0.000807
PM 2.5	0.000684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000942
N_2O	0.000184

Pollutant	Emissions Per Year (TONs)
CO_2	22.405928
CO_2e	22.481017

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.013454
SO_x	0.007484
NO_x	0.095580
CO	0.021218

Pollutant	Emissions Per Year (TONs)
PM 10	0.000807
PM 2.5	0.000684
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000942
N_2O	0.000184

Pollutant	Emissions Per Year (TONs)
CO_2	22.405928
CO_2e	22.481017

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 211
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-158)

- Activity Description:
In 2037, remove 5 T-38C Low-Altitude Operations in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004856
SO_x	-0.006928
NO_x	-0.012432
CO	-0.200660

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007317
PM 2.5	-0.006540
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.004856
SO_x	-0.006928
NO_x	-0.012432
CO	-0.200660

Pollutant	Emissions Per Year (TONs)
PM 10	-0.007317
PM 2.5	-0.006540
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-159)

- Activity Description:
In 2037, remove 61 T-38C Low-Altitude Operations in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.057554
SO_x	-0.082110
NO_x	-0.147337
CO	-2.378111

Pollutant	Emissions Per Year (TONs)
PM 10	-0.086714
PM 2.5	-0.077505
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.057554
SO_x	-0.082110
NO_x	-0.147337
CO	-2.378111

Pollutant	Emissions Per Year (TONs)
PM 10	-0.086714
PM 2.5	-0.077505
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 61
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1141)

- Activity Description:
In 2037, remove 6 T-38C Low-Altitude Operations in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005994
SO_x	-0.008551
NO_x	-0.015345
CO	-0.247672

Pollutant	Emissions Per Year (TONs)
PM 10	-0.009031
PM 2.5	-0.008072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.005994
SO_x	-0.008551
NO_x	-0.015345
CO	-0.247672

Pollutant	Emissions Per Year (TONs)
PM 10	-0.009031
PM 2.5	-0.008072
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61

Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1142)

- Activity Description:
In 2037, remove 7 T-38C Low-Altitude Operations in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006993
SO_x	-0.009977
NO_x	-0.017902
CO	-0.288951

Pollutant	Emissions Per Year (TONs)
PM 10	-0.010536
PM 2.5	-0.009417
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1143)

- Activity Description:
In 2037, remove 37 T-38C Low-Altitude Operations in VR-1143 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042097
SO_x	-0.060058
NO_x	-0.107768
CO	-1.739438

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063426
PM 2.5	-0.056690
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.042097
SO_x	-0.060058
NO_x	-0.107768
CO	-1.739438

Pollutant	Emissions Per Year (TONs)
PM 10	-0.063426
PM 2.5	-0.056690
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64

Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		37
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, remove 12 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		12
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Low-Altitude Operations (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 120 T-38C Low-Altitude Operations in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006850
SO_x	-0.001538
NO_x	-0.001083
CO	-0.123359

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002919
PM 2.5	-0.002622
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000194
N_2O	-0.000038

Pollutant	Emissions Per Year (TONs)
CO_2	-4.603343
CO_2e	-4.618771

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.006850
SO_x	-0.001538
NO_x	-0.001083
CO	-0.123359

Pollutant	Emissions Per Year (TONs)
PM 10	-0.002919
PM 2.5	-0.002622
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000194
N_2O	-0.000038

Pollutant	Emissions Per Year (TONs)
CO_2	-4.603343
CO_2e	-4.618771

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		120
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (IR-103)

- Activity Description:
In 2037, remove 4 T-38C Low-Altitude Operations in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002220
SO_x	-0.003167
NO_x	-0.005683
CO	-0.091730

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003345
PM 2.5	-0.002990
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002220
SO_x	-0.003167
NO_x	-0.005683
CO	-0.091730

Pollutant	Emissions Per Year (TONs)
PM 10	-0.003345
PM 2.5	-0.002990
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: Alternative 3 GHG Report (Destination Cycles)

AIR CONFORMITY APPLICABILITY MODEL REPORT GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the GHG emissions analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, SUA Destination Cycle

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset

by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action's start through the action's "steady state" (SS, net gain/loss in emission stabilized and the action is fully implemented) of emissions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected steady state of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2034	4,748	0.19965167	0.03895209	4,764	68,039	No
2035	18,732	0.78766971	0.15367454	18,795	68,039	No
2036	35,348	1.48635028	0.28998727	35,467	68,039	No
2037	47,391	1.99270747	0.38877767	47,549	68,039	No
2038 [SS Year]	47,391	1.99270747	0.38877767	47,549	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	700,652,689	3,554,625	135,896	836,194,567
2035	700,652,689	3,554,625	135,896	836,194,567
2036	700,652,689	3,554,625	135,896	836,194,567
2037	700,652,689	3,554,625	135,896	836,194,567
2038 [SS Year]	700,652,689	3,554,625	135,896	836,194,567

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2035	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2036	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2037	5,136,454,179	25,626,912	1,500,708	6,251,695,230
2038 [SS Year]	5,136,454,179	25,626,912	1,500,708	6,251,695,230

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (Rtba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where the action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2034-2038	State Total	3,503,263,447	17,773,124	679,479	4,180,972,834
2034-2038	U.S. Total	25,682,270,895	128,134,558	7,503,538	31,258,476,148
2034-2038	Action	153,610	6.459087	1.260169	154,125
Percent of State Totals		0.00438477%	0.00003634%	0.00018546%	0.00368634%
Percent of U.S. Totals		0.00059812%	0.00000504%	0.00001679%	0.00049307%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00006607%.*

* Global value based on the U.S. emitting 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

SUA ROI: Alternative 3 ACAM Detail Report (Destination Cycles)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Beckham, OK; Bryan, OK; Caddo, OK; Carter, OK; Coal, OK; Comanche, OK; Garvin, OK; Grady, OK; Greer, OK; Harmon, OK; Jackson, OK; Jefferson, OK; Johnston, OK; Kiowa, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Roger Mills, OK; Stephens, OK; Tillman, OK; Washita, OK; Archer, TX; Baylor, TX; Bosque, TX; Callahan, TX; Childress, TX; Clay, TX; Collingsworth, TX; Comanche, TX; Cooke, TX; Cottle, TX; Denton, TX; Dickens, TX; Donley, TX; Eastland, TX; Erath, TX; Foard, TX; Gray, TX; Grayson, TX; Hall, TX; Hamilton, TX; Hardeman, TX; Haskell, TX; Hood, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Knox, TX; Montague, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Somervell, TX; Throckmorton, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX; Wise, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX (VR-1146 only)

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, SUA Destination Cycle

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

The analysis for all construction and operation actions assumes the following: (1) major construction projects, such as those that include new facilities, would occur over a period of 2 years and minor construction projects, such as those that include renovation of existing facilities, would occur over a period of 1 year; (2) during construction, no materials would be required to be hauled on- or off-site as excavated spoils will be used on-site; (3) no new emergency generators, or if any were needed for new facilities, their emissions would be offset by removing generators that were supporting T-38C operations; and (4) T-7A fuel cell maintenance, composite repair, NDI testing, and fuel storage/dispensing operations/emissions would be equally offset by eliminating those corresponding operations/emissions supporting the T-38C operations. It was assumed all construction would be complete prior to the aircraft transition period (starting in 2034). Surrogate construction years of 2031 and 2032 were used for the construction period. The actual construction period may be different than what was assumed for the analysis.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Destination Cycles (IR-103)
3.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-158)
4.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-159)
5.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1141)
6.	Aircraft	2034: Add T-7A MTR Destination Cycles(VR-1142)
7.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1143)
8.	Aircraft	2034: Add T-7A MTR Destination Cycles (VR-1146)
9.	Aircraft	2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
10.	Aircraft	2034: Add T-7A MOA Destination Cycles (Hollis MOA)
11.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)
12.	Aircraft	2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)
13.	Aircraft	2034: Add T-7A MOA Destination Cycles (Washita MOA)
14.	Aircraft	2034: Remove T-38C MTR Destination Cycles (IR-103)
15.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-158)
16.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-159)
17.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1141)
18.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1142)
19.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1143)
20.	Aircraft	2034: Remove T-38C MTR Destination Cycles (VR-1146)
21.	Aircraft	2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
22.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Hollis MOA)
23.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
24.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
25.	Aircraft	2034: Remove T-38C MOA Destination Cycles (Washita MOA)
26.	Aircraft	2035: Add T-7A MTR Destination Cycles (IR-103)
27.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-158)
28.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-159)
29.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1141)
30.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1142)
31.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1143)
32.	Aircraft	2035: Add T-7A MTR Destination Cycles (VR-1146)
33.	Aircraft	2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

34.	Aircraft	2035: Add T-7A MOA Destination Cycles (Hollis MOA)
35.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)
36.	Aircraft	2035: Add T-7A MOA Destination Cycles (Westover 2MOA)
37.	Aircraft	2035: Add T-7A MOA Destination Cycles (Washita MOA)
38.	Aircraft	2035: Remove T-38C MTR Destination Cycles (IR-103)
39.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-158)
40.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-159)
41.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1141)
42.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1142)
43.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1143)
44.	Aircraft	2035: Remove T-38C MTR Destination Cycles (VR-1146)
45.	Aircraft	2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
46.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Hollis MOA)
47.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
48.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
49.	Aircraft	2035: Remove T-38C MOA Destination Cycles (Washita MOA)
50.	Aircraft	2036: Add T-7A MTR Destination Cycles (IR-103)
51.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-158)
52.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-159)
53.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1141)
54.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1142)
55.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1143)
56.	Aircraft	2036: Add T-7A MTR Destination Cycles (VR-1146)
57.	Aircraft	2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
58.	Aircraft	2036: Add T-7A MOA Destination Cycles (Hollis MOA)
59.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)
60.	Aircraft	2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)
61.	Aircraft	2036: Add T-7A MOA Destination Cycles (Washita MOA)
62.	Aircraft	2036: Remove T-38C MTR Destination Cycles (IR-103)
63.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-158)
64.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-159)
65.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1141)
66.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1142)
67.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1143)
68.	Aircraft	2036: Remove T-38C MTR Destination Cycles (VR-1146)
69.	Aircraft	2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
70.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Hollis MOA)
71.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
72.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
73.	Aircraft	2036: Remove T-38C MOA Destination Cycles (Washita MOA)
74.	Aircraft	2037: Add T-7A MTR Destination Cycles (IR-103)
75.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-158)
76.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-159)
77.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1141)
78.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1142)
79.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1143)
80.	Aircraft	2037: Add T-7A MTR Destination Cycles (VR-1146)
81.	Aircraft	2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)
82.	Aircraft	2037: Add T-7A MOA Destination Cycles (Hollis MOA)
83.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)
84.	Aircraft	2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)
85.	Aircraft	2037: Add T-7A MOA Destination Cycles (Washita MOA)
86.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-158)
87.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-159)
88.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1141)
89.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1142)

90.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1143)
91.	Aircraft	2037: Remove T-38C MTR Destination Cycles (VR-1146)
92.	Aircraft	2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)
93.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Hollis MOA)
94.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)
95.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)
96.	Aircraft	2037: Remove T-38C MOA Destination Cycles (Washita MOA)
97.	Aircraft	2037: Remove T-38C MTR Destination Cycles (IR-103)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, add 3 T-7A Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.000681
N_2O	0.000133

Pollutant	Emissions Per Year (TONs)
CO_2	16.204601
CO_2e	16.258908

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, add 4 T-7A Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A

Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, add 51 T-7A Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019692
N_2O	0.003842

Pollutant	Emissions Per Year (TONs)
CO_2	468.312976
CO_2e	469.882449

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		51
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, add 5 T-7A Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002044
N_2O	0.000399

Pollutant	Emissions Per Year (TONs)
CO_2	48.613804
CO_2e	48.776725

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles(VR-1142)

- Activity Description:
In 2034, add 6 T-7A Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002453
N_2O	0.000479

Pollutant	Emissions Per Year (TONs)
CO_2	58.336564
CO_2e	58.532070

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		6
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2034, add 31 T-7A Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.014434
N_2O	0.002816

Pollutant	Emissions Per Year (TONs)
CO_2	343.267470
CO_2e	344.417874

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		31
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2034, add 11 T-7A Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004747
N_2O	0.000926

Pollutant	Emissions Per Year (TONs)
CO_2	112.892055
CO_2e	113.270394

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004747
N_2O	0.000926

Pollutant	Emissions Per Year (TONs)
CO_2	112.892055
CO_2e	113.270394

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 11
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, add 252 T-7A Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001125
N_2O	0.000220

Pollutant	Emissions Per Year (TONs)
CO_2	26.759686
CO_2e	26.849367

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001125
N_2O	0.000220

Pollutant	Emissions Per Year (TONs)
CO_2	26.759686
CO_2e	26.849367

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 252
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, add 17 T-7A Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002662
N_2O	0.000519

Pollutant	Emissions Per Year (TONs)
CO_2	63.299814
CO_2e	63.511953

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002662
N_2O	0.000519

Pollutant	Emissions Per Year (TONs)
CO_2	63.299814
CO_2e	63.511953

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		17
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, add 929 T-7A Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.174543
N_2O	0.034053

Pollutant	Emissions Per Year (TONs)
CO_2	4150.978406
CO_2e	4164.889724

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.174543
N_2O	0.034053

Pollutant	Emissions Per Year (TONs)
CO_2	4150.978406
CO_2e	4164.889724

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 929
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, add 237 T-7A Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.046024
N_2O	0.008979

Pollutant	Emissions Per Year (TONs)
CO_2	1094.534097
CO_2e	1098.202247

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.046024
N_2O	0.008979

Pollutant	Emissions Per Year (TONs)
CO_2	1094.534097
CO_2e	1098.202247

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 237
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, add 467 T-7A Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085977
N_2O	0.016774

Pollutant	Emissions Per Year (TONs)
CO_2	2044.698023
CO_2e	2051.550491

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.085977
N_2O	0.016774

Pollutant	Emissions Per Year (TONs)
CO_2	2044.698023
CO_2e	2051.550491

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

13.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		467
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2034, remove 3 T-38C Destination Cycles in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000299
N_2O	-0.000058

Pollutant	Emissions Per Year (TONs)
CO_2	-7.111637
CO_2e	-7.135470

14.2 Aircraft & Engines

14.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

14.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		3
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2034, remove 4 T-38C Destination Cycles in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000698
N_2O	-0.000136

Pollutant	Emissions Per Year (TONs)
CO_2	-16.593819
CO_2e	-16.649431

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

15.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2034, remove 45 T-38C Destination Cycles in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007625
N_2O	-0.001488

Pollutant	Emissions Per Year (TONs)
CO_2	-181.346738
CO_2e	-181.954492

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

16.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2034, remove 4 T-38C Destination Cycles in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000718
N_2O	-0.000140

Pollutant	Emissions Per Year (TONs)
CO_2	-17.067928
CO_2e	-17.125129

17.2 Aircraft & Engines

17.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

17.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

17.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

18. Aircraft

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:

In 2034, remove 5 T-38C Destination Cycles in VR-1142 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000897
N_2O	-0.000175

Pollutant	Emissions Per Year (TONs)
CO_2	-21.334910
CO_2e	-21.406411

18.2 Aircraft & Engines

18.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

18.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

18.3 Flight Operations

18.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

18.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

19. Aircraft

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2034, remove 27 T-38C Destination Cycles in VR-1143 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005517
N_2O	-0.001076

Pollutant	Emissions Per Year (TONs)
CO_2	-131.209699
CO_2e	-131.649427

19.2 Aircraft & Engines

19.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

19.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

19.3 Flight Operations

19.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

19.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

20. Aircraft

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2034: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2034, remove 10 T-38C Destination Cycles in VR-1146 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2034

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001894
N_2O	-0.000369

Pollutant	Emissions Per Year (TONs)
CO_2	-45.040366
CO_2e	-45.191312

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001894
N_2O	-0.000369

Pollutant	Emissions Per Year (TONs)
CO_2	-45.040366
CO_2e	-45.191312

20.2 Aircraft & Engines

20.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

20.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

20.3 Flight Operations

20.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

20.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2034, remove 220 T-38C Destination Cycles in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000355
N_2O	-0.000069

Pollutant	Emissions Per Year (TONs)
CO_2	-8.439463
CO_2e	-8.467746

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000355
N_2O	-0.000069

Pollutant	Emissions Per Year (TONs)
CO_2	-8.439463
CO_2e	-8.467746

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 220
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2034, remove 15 T-38C Destination Cycles in Hollis MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001057
N_2O	-0.000206

Pollutant	Emissions Per Year (TONs)
CO_2	-25.139396
CO_2e	-25.223646

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001057
N_2O	-0.000206

Pollutant	Emissions Per Year (TONs)
CO_2	-25.139396
CO_2e	-25.223646

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

22.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

23. Aircraft

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2034, remove 813 T-38C Destination Cycles in Westover 1 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.068752
N_2O	-0.013414

Pollutant	Emissions Per Year (TONs)
CO_2	-1635.066305
CO_2e	-1640.545959

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.068752
N_2O	-0.013414

Pollutant	Emissions Per Year (TONs)
CO_2	-1635.066305
CO_2e	-1640.545959

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 813
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2034, remove 208 T-38C Destination Cycles in Westover 2 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.018590
N_2O	-0.003627

Pollutant	Emissions Per Year (TONs)
CO_2	-442.107011
CO_2e	-443.588659

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.018590
N_2O	-0.003627

Pollutant	Emissions Per Year (TONs)
CO_2	-442.107011
CO_2e	-443.588659

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

24.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 208
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2034, remove 409 T-38C Destination Cycles in Washita MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.029490
N_2O	-0.005754

Pollutant	Emissions Per Year (TONs)
CO_2	-701.342867
CO_2e	-703.693302

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.029490
N_2O	-0.005754

Pollutant	Emissions Per Year (TONs)
CO_2	-701.342867
CO_2e	-703.693302

25.2 Aircraft & Engines

25.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

25.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 409
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

26. Aircraft

26.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, add 13 T-7A Destination Cycles in IR-103 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

26.2 Aircraft & Engines

26.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

26.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, add 17 T-7A Destination Cycles in VR-158 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006757
N_2O	0.001318

Pollutant	Emissions Per Year (TONs)
CO_2	160.695629
CO_2e	161.234174

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.006757
N_2O	0.001318

Pollutant	Emissions Per Year (TONs)
CO_2	160.695629
CO_2e	161.234174

27.2 Aircraft & Engines

27.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

27.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 17
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

28. Aircraft

28.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, add 196 T-7A Destination Cycles in VR-159 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.075679
N_2O	0.014765

Pollutant	Emissions Per Year (TONs)
CO_2	1799.791044
CO_2e	1805.822747

28.2 Aircraft & Engines

28.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

28.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

28.3 Flight Operations

28.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		196
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

28.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

29. Aircraft

29.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, add 19 T-7A Destination Cycles in VR-1141 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007768
N_2O	0.001515

Pollutant	Emissions Per Year (TONs)
CO_2	184.732454
CO_2e	185.351554

29.2 Aircraft & Engines

29.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

29.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

29.3 Flight Operations

29.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		19
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

29.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

30. Aircraft

30.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2035, add 24 T-7A Destination Cycles in VR-1142 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009812
N_2O	0.001914

Pollutant	Emissions Per Year (TONs)
CO_2	233.346258
CO_2e	234.128279

30.2 Aircraft & Engines

30.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

30.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

30.3 Flight Operations

30.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 24
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

30.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

31. Aircraft

31.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:

In 2035, add 120 T-7A Destination Cycles in VR-1143 with 76 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.055873
N_2O	0.010901

Pollutant	Emissions Per Year (TONs)
CO_2	1328.777302
CO_2e	1333.230479

31.2 Aircraft & Engines

31.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

31.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

31.3 Flight Operations

31.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 120
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

31.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

32. Aircraft

32.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2035, add 43 T-7A Destination Cycles in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018556
N_2O	0.003620

Pollutant	Emissions Per Year (TONs)
CO_2	441.305307
CO_2e	442.784269

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.018556
N_2O	0.003620

Pollutant	Emissions Per Year (TONs)
CO_2	441.305307
CO_2e	442.784269

32.2 Aircraft & Engines

32.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

32.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

32.3 Flight Operations

32.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		43
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

32.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

33. Aircraft

33.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, add 965 T-7A Destination Cycles in R-5601 Falcon Range with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004309
N_2O	0.000841

Pollutant	Emissions Per Year (TONs)
CO_2	102.472608
CO_2e	102.816028

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004309
N_2O	0.000841

Pollutant	Emissions Per Year (TONs)
CO_2	102.472608
CO_2e	102.816028

33.2 Aircraft & Engines

33.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

33.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

33.3 Flight Operations

33.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		965
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

33.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

34. Aircraft

34.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, add 65 T-7A Destination Cycles in Hollis MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010177
N_2O	0.001986

Pollutant	Emissions Per Year (TONs)
CO_2	242.028701
CO_2e	242.839821

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010177
N_2O	0.001986

Pollutant	Emissions Per Year (TONs)
CO_2	242.028701
CO_2e	242.839821

34.2 Aircraft & Engines

34.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

34.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

34.3 Flight Operations

34.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 65
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

34.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

35. Aircraft

35.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, add 3,560 T-7A Destination Cycles in Westover 1 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.668861
N_2O	0.130495

Pollutant	Emissions Per Year (TONs)
CO_2	15906.870964
CO_2e	15960.180214

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.668861
N_2O	0.130495

Pollutant	Emissions Per Year (TONs)
CO_2	15906.870964
CO_2e	15960.180214

35.2 Aircraft & Engines

35.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

35.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

35.3 Flight Operations

35.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		3560
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

35.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

36. Aircraft

36.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Westover 2MOA)

- Activity Description:
In 2035, add 909 T-7A Destination Cycles in Westover 2 MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.176521
N_2O	0.034439

Pollutant	Emissions Per Year (TONs)
CO_2	4198.023181
CO_2e	4212.092162

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.176521
N_2O	0.034439

Pollutant	Emissions Per Year (TONs)
CO_2	4198.023181
CO_2e	4212.092162

36.2 Aircraft & Engines

36.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

36.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

36.3 Flight Operations

36.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		909
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

36.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

37. Aircraft

37.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, add 1,790 T-7A Destination Cycles in Washita MOA with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.329546
N_2O	0.064295

Pollutant	Emissions Per Year (TONs)
CO_2	7837.279361
CO_2e	7863.544709

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.329546
N_2O	0.064295

Pollutant	Emissions Per Year (TONs)
CO_2	7837.279361
CO_2e	7863.544709

37.2 Aircraft & Engines

37.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

37.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

37.3 Flight Operations

37.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 76
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1790
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

37.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

38. Aircraft

38.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2035, remove 14 T-38C Destination Cycles in IR-103 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001395
N_2O	-0.000272

Pollutant	Emissions Per Year (TONs)
CO_2	-33.187638
CO_2e	-33.298861

38.2 Aircraft & Engines

38.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

38.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

38.3 Flight Operations

38.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 14
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 20
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

38.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

39. Aircraft

39.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2035, remove 19 T-38C Destination Cycles in VR-158 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003314
N_2O	-0.000647

Pollutant	Emissions Per Year (TONs)
CO_2	-78.820641
CO_2e	-79.084796

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003314
N_2O	-0.000647

Pollutant	Emissions Per Year (TONs)
CO_2	-78.820641
CO_2e	-79.084796

39.2 Aircraft & Engines

39.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

39.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

39.3 Flight Operations

39.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 19
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

39.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

40. Aircraft

40.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2035, remove 224 T-38C Destination Cycles in VR-159 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.037957
N_2O	-0.007405

Pollutant	Emissions Per Year (TONs)
CO_2	-902.703764
CO_2e	-905.729027

40.2 Aircraft & Engines

40.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

40.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

40.3 Flight Operations

40.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 224
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0

Military (mins): 0
AfterBurn (mins): 0

40.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

41. Aircraft

41.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2035, remove 22 T-38C Destination Cycles in VR-1141 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003947
N_2O	-0.000770

Pollutant	Emissions Per Year (TONs)
CO_2	-93.873606
CO_2e	-94.188208

41.2 Aircraft & Engines

41.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

41.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

41.3 Flight Operations

41.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

41.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

42. Aircraft

42.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2035, remove 27 T-38C Destination Cycles in VR-1142 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004844
N_2O	-0.000945

Pollutant	Emissions Per Year (TONs)
CO_2	-115.208516
CO_2e	-115.594618

42.2 Aircraft & Engines

42.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

42.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

42.3 Flight Operations

42.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 27
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

42.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

43. Aircraft

43.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo

Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2035, remove 137 T-38C Destination Cycles in VR-1143 with 28 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2035

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.027995
N_2O	-0.005462

Pollutant	Emissions Per Year (TONs)
CO_2	-665.767732
CO_2e	-667.998942

43.2 Aircraft & Engines

43.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:

Original Engine Name:

43.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

43.3 Flight Operations

43.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 137
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

43.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

44. Aircraft

44.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2035: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2035, remove 49 T-38C Destination Cycles in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009280
N_2O	-0.001811

Pollutant	Emissions Per Year (TONs)
CO_2	-220.697795
CO_2e	-221.437428

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009280
N_2O	-0.001811

Pollutant	Emissions Per Year (TONs)
CO_2	-220.697795
CO_2e	-221.437428

44.2 Aircraft & Engines

44.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

44.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

44.3 Flight Operations

44.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 49
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

44.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

45. Aircraft

45.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2035, remove 1,102 T-38C Destination Cycles in R-5601 Falcon Range with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001778
N_2O	-0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	-42.274036
CO_2e	-42.415710

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001778
N_2O	-0.000347

Pollutant	Emissions Per Year (TONs)
CO_2	-42.274036
CO_2e	-42.415710

45.2 Aircraft & Engines

45.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

45.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

45.3 Flight Operations

45.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1102
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

45.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

46. Aircraft

46.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2035, remove 74 T-38C Destination Cycles in Hollis MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005215
N_2O	-0.001017

Pollutant	Emissions Per Year (TONs)
CO_2	-124.021019
CO_2e	-124.436655

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005215
N_2O	-0.001017

Pollutant	Emissions Per Year (TONs)
CO_2	-124.021019
CO_2e	-124.436655

46.2 Aircraft & Engines

46.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

46.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

46.3 Flight Operations

46.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		74
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

46.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

47. Aircraft

47.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2035, remove 4,063 T-38C Destination Cycles in Westover 1 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.343592
N_2O	-0.067035

Pollutant	Emissions Per Year (TONs)
CO_2	-8171.309221
CO_2e	-8198.694014

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.343592
N_2O	-0.067035

Pollutant	Emissions Per Year (TONs)
CO_2	-8171.309221
CO_2e	-8198.694014

47.2 Aircraft & Engines

47.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

47.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

47.3 Flight Operations

47.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		28
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4063
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

47.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

48. Aircraft

48.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2035, remove 1,477 T-38C Destination Cycles in Westover 2 MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.132007
N_2O	-0.025755

Pollutant	Emissions Per Year (TONs)
CO_2	-3139.384879
CO_2e	-3149.906009

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.132007
N_2O	-0.025755

Pollutant	Emissions Per Year (TONs)
CO_2	-3139.384879
CO_2e	-3149.906009

48.2 Aircraft & Engines

48.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

48.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

48.3 Flight Operations

48.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1477
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

48.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

49. Aircraft

49.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2035, remove 2,043 T-38C Destination Cycles in Washita MOA with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.147308
N_2O	-0.028740

Pollutant	Emissions Per Year (TONs)
CO_2	-3503.284787
CO_2e	-3515.025467

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.147308
N_2O	-0.028740

Pollutant	Emissions Per Year (TONs)
CO_2	-3503.284787
CO_2e	-3515.025467

49.2 Aircraft & Engines

49.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

49.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

49.3 Flight Operations

49.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2043
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

49.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

50. Aircraft

50.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, add 13 T-7A Destination Cycles in IR-103 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002953
N_2O	0.000576

Pollutant	Emissions Per Year (TONs)
CO_2	70.219939
CO_2e	70.455269

50.2 Aircraft & Engines

50.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

50.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

50.3 Flight Operations

50.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		13
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

50.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

51. Aircraft

51.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, add 18 T-7A Destination Cycles in VR-158 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007154
N_2O	0.001396

Pollutant	Emissions Per Year (TONs)
CO_2	170.148313
CO_2e	170.718537

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.007154
N_2O	0.001396

Pollutant	Emissions Per Year (TONs)
CO_2	170.148313
CO_2e	170.718537

51.2 Aircraft & Engines

51.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

51.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

51.3 Flight Operations

51.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		18
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

51.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

52. Aircraft

52.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, add 205 T-7A Destination Cycles in VR-159 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.079154
N_2O	0.015443

Pollutant	Emissions Per Year (TONs)
CO_2	1882.434511
CO_2e	1888.743179

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.079154
N_2O	0.015443

Pollutant	Emissions Per Year (TONs)
CO_2	1882.434511
CO_2e	1888.743179

52.2 Aircraft & Engines

52.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

52.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

52.3 Flight Operations

52.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 205
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

52.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

53. Aircraft

53.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, add 20 T-7A Destination Cycles in VR-1141 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008177
N_2O	0.001595

Pollutant	Emissions Per Year (TONs)
CO_2	194.455215
CO_2e	195.106899

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.008177
N_2O	0.001595

Pollutant	Emissions Per Year (TONs)
CO_2	194.455215
CO_2e	195.106899

53.2 Aircraft & Engines

53.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

53.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

53.3 Flight Operations

53.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 20
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

53.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

54. Aircraft

54.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2036, add 25 T-7A Destination Cycles in VR-1142 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010221
N_2O	0.001994

Pollutant	Emissions Per Year (TONs)
CO_2	243.069019
CO_2e	243.883624

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010221
N_2O	0.001994

Pollutant	Emissions Per Year (TONs)
CO_2	243.069019
CO_2e	243.883624

54.2 Aircraft & Engines

54.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

54.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

54.3 Flight Operations

54.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		25
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

54.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

55. Aircraft

55.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:
In 2036, add 126 T-7A Destination Cycles in VR-1143 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.058667
N_2O	0.011446

Pollutant	Emissions Per Year (TONs)
CO_2	1395.216167
CO_2e	1399.892003

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.058667
N_2O	0.011446

Pollutant	Emissions Per Year (TONs)
CO_2	1395.216167
CO_2e	1399.892003

55.2 Aircraft & Engines

55.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

55.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

55.3 Flight Operations

55.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		126
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

55.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)

$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

56. Aircraft

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2036, add 45 T-7A Destination Cycles in VR-1146 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019419
N_2O	0.003789

Pollutant	Emissions Per Year (TONs)
CO_2	461.831135
CO_2e	463.378886

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019419
N_2O	0.003789

Pollutant	Emissions Per Year (TONs)
CO_2	461.831135
CO_2e	463.378886

56.2 Aircraft & Engines

56.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

56.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

56.3 Flight Operations

56.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

56.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

57. Aircraft

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, add 1,007 T-7A Destination Cycles in R-5601 Falcon Range with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004496
N_2O	0.000877

Pollutant	Emissions Per Year (TONs)
CO_2	106.932555
CO_2e	107.290922

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004496
N_2O	0.000877

Pollutant	Emissions Per Year (TONs)
CO_2	106.932555
CO_2e	107.290922

57.2 Aircraft & Engines

57.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

57.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

57.3 Flight Operations

57.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1007
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

57.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

58. Aircraft

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, add 67 T-7A Destination Cycles in Hollis MOA with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010490
N_2O	0.002047

Pollutant	Emissions Per Year (TONs)
CO_2	249.475738
CO_2e	250.311815

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.010490
N_2O	0.002047

Pollutant	Emissions Per Year (TONs)
CO_2	249.475738
CO_2e	250.311815

58.2 Aircraft & Engines

58.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

58.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

58.3 Flight Operations

58.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		67
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	19.5
Climb Out [Intermediate] (mins):	4.5
Takeoff [Military] (mins):	6
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

58.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

59. Aircraft

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, add 3,714 T-7A Destination Cycles in Westover 1 MOA with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.697795
N_2O	0.136140

Pollutant	Emissions Per Year (TONs)
CO_2	16594.977179
CO_2e	16650.592504

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.697795
N_2O	0.136140

Pollutant	Emissions Per Year (TONs)
CO_2	16594.977179
CO_2e	16650.592504

59.2 Aircraft & Engines

59.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

59.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

59.3 Flight Operations

59.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3714
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

59.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

60. Aircraft

60.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, add 949 T-7A Destination Cycles in Westover 2 MOA with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.184288
N_2O	0.035955

Pollutant	Emissions Per Year (TONs)
CO_2	4382.754674
CO_2e	4397.442752

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.184288
N_2O	0.035955

Pollutant	Emissions Per Year (TONs)
CO_2	4382.754674
CO_2e	4397.442752

60.2 Aircraft & Engines

60.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

60.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

60.3 Flight Operations

60.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 124
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 949
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

60.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

61. Aircraft

61.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, add 1,868 T-7A Destination Cycles in Washita MOA with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.343906
N_2O	0.067096

Pollutant	Emissions Per Year (TONs)
CO_2	8178.792093
CO_2e	8206.201964

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.343906
N_2O	0.067096

Pollutant	Emissions Per Year (TONs)
CO_2	8178.792093
CO_2e	8206.201964

61.2 Aircraft & Engines

61.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

61.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

61.3 Flight Operations

61.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1868
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

61.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

62. Aircraft

62.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2036, remove 15 T-38C Destination Cycles in IR-103 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001495
N_2O	-0.000292

Pollutant	Emissions Per Year (TONs)
CO_2	-35.558184
CO_2e	-35.677351

62.2 Aircraft & Engines

62.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

62.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

62.3 Flight Operations

62.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		15
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

62.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

63. Aircraft

63.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2036, remove 20 T-38C Destination Cycles in VR-158 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003489
N_2O	-0.000681

Pollutant	Emissions Per Year (TONs)
CO_2	-82.969096
CO_2e	-83.247153

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.003489
N_2O	-0.000681

Pollutant	Emissions Per Year (TONs)
CO_2	-82.969096
CO_2e	-83.247153

63.2 Aircraft & Engines

63.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

63.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

63.3 Flight Operations

63.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		20
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	35
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

63.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

64. Aircraft

64.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2036, remove 229 T-38C Destination Cycles in VR-159 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.038805
N_2O	-0.007571

Pollutant	Emissions Per Year (TONs)
CO_2	-922.853402
CO_2e	-925.946193

64.2 Aircraft & Engines

64.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

64.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

64.3 Flight Operations

64.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		229
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

64.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

65. Aircraft

65.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2036, remove 23 T-38C Destination Cycles in VR-1141 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004127
N_2O	-0.000805

Pollutant	Emissions Per Year (TONs)
CO_2	-98.140588
CO_2e	-98.469490

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.004127
N_2O	-0.000805

Pollutant	Emissions Per Year (TONs)
CO_2	-98.140588
CO_2e	-98.469490

65.2 Aircraft & Engines

65.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

65.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

65.3 Flight Operations

65.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 23
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

65.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

66. Aircraft

66.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2036, remove 28 T-38C Destination Cycles in VR-1142 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005024
N_2O	-0.000980

Pollutant	Emissions Per Year (TONs)
CO_2	-119.475498
CO_2e	-119.875901

66.2 Aircraft & Engines

66.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

66.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

66.3 Flight Operations

66.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 28
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

66.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

67. Aircraft

67.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2036, remove 141 T-38C Destination Cycles in VR-1143 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.028812
N_2O	-0.005621

Pollutant	Emissions Per Year (TONs)
CO_2	-685.206206
CO_2e	-687.502561

67.2 Aircraft & Engines

67.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

67.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

67.3 Flight Operations

67.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 141
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	41
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

67.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

68. Aircraft

68.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2036: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:

In 2036, remove 50 T-38C Destination Cycles in VR-1146 with 56 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2036

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009469
N_2O	-0.001847

Pollutant	Emissions Per Year (TONs)
CO_2	-225.201832
CO_2e	-225.956559

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.009469
N_2O	-0.001847

Pollutant	Emissions Per Year (TONs)
CO_2	-225.201832
CO_2e	-225.956559

68.2 Aircraft & Engines

68.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

68.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

68.3 Flight Operations

68.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 50
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

68.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

69. Aircraft

69.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2036, remove 1,128 T-38C Destination Cycles in R-5601 Falcon Range with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001820
N_2O	-0.000355

Pollutant	Emissions Per Year (TONs)
CO_2	-43.271427
CO_2e	-43.416444

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001820
N_2O	-0.000355

Pollutant	Emissions Per Year (TONs)
CO_2	-43.271427
CO_2e	-43.416444

69.2 Aircraft & Engines

69.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

69.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

69.3 Flight Operations

69.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1128
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

69.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

70. Aircraft

70.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2036, remove 75 T-38C Destination Cycles in Hollis MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005285
N_2O	-0.001031

Pollutant	Emissions Per Year (TONs)
CO_2	-125.696979
CO_2e	-126.118232

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.005285
N_2O	-0.001031

Pollutant	Emissions Per Year (TONs)
CO_2	-125.696979
CO_2e	-126.118232

70.2 Aircraft & Engines

70.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

70.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

70.3 Flight Operations

70.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 75
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

70.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

71. Aircraft

71.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2036, remove 4,159 T-38C Destination Cycles in Westover 1 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.351710
N_2O	-0.068619

Pollutant	Emissions Per Year (TONs)
CO_2	-8364.379781
CO_2e	-8392.411618

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.351710
N_2O	-0.068619

Pollutant	Emissions Per Year (TONs)
CO_2	-8364.379781
CO_2e	-8392.411618

71.2 Aircraft & Engines

71.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C

Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

71.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

71.3 Flight Operations

71.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 4159
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

71.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

72. Aircraft

72.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2036, remove 623 T-38C Destination Cycles in Westover 2 MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.055680
N_2O	-0.010863

Pollutant	Emissions Per Year (TONs)
CO_2	-1324.195518
CO_2e	-1328.633340

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.055680
N_2O	-0.010863

Pollutant	Emissions Per Year (TONs)
CO_2	-1324.195518
CO_2e	-1328.633340

72.2 Aircraft & Engines

72.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

72.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

72.3 Flight Operations

72.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 623
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

72.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

73. Aircraft

73.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2036, remove 2,092 T-38C Destination Cycles in Washita MOA with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.150841
N_2O	-0.029429

Pollutant	Emissions Per Year (TONs)
CO_2	-3587.308749
CO_2e	-3599.331022

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.150841
N_2O	-0.029429

Pollutant	Emissions Per Year (TONs)
CO_2	-3587.308749
CO_2e	-3599.331022

73.2 Aircraft & Engines

73.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

73.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

73.3 Flight Operations

73.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 56
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 2092
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 7.5
Climb Out [Intermediate] (mins): 10
Takeoff [Military] (mins): 7.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

73.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

74. Aircraft

74.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, add 7 T-7A Destination Cycles in IR-103 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001590
N_2O	0.000310

Pollutant	Emissions Per Year (TONs)
CO_2	37.810736
CO_2e	37.937453

74.2 Aircraft & Engines

74.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

74.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

74.3 Flight Operations

74.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		7
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

74.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

75. Aircraft

75.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, add 9 T-7A Destination Cycles in VR-158 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003577
N_2O	0.000698

Pollutant	Emissions Per Year (TONs)
CO_2	85.074157
CO_2e	85.359268

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003577
N_2O	0.000698

Pollutant	Emissions Per Year (TONs)
CO_2	85.074157
CO_2e	85.359268

75.2 Aircraft & Engines

75.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

75.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

75.3 Flight Operations

75.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 35

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

75.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

76. Aircraft

76.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, add 107 T-7A Destination Cycles in VR-159 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.041314
N_2O	0.008060

Pollutant	Emissions Per Year (TONs)
CO_2	982.538989
CO_2e	985.831806

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.041314
N_2O	0.008060

Pollutant	Emissions Per Year (TONs)
CO_2	982.538989
CO_2e	985.831806

76.2 Aircraft & Engines

76.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

76.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

76.3 Flight Operations

76.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		107
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	34
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

76.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

77. Aircraft

77.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, add 10 T-7A Destination Cycles in VR-1141 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004088
N_2O	0.000798

Pollutant	Emissions Per Year (TONs)
CO_2	97.227607
CO_2e	97.553450

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004088
N_2O	0.000798

Pollutant	Emissions Per Year (TONs)
CO_2	97.227607
CO_2e	97.553450

77.2 Aircraft & Engines

77.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

77.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

77.3 Flight Operations

77.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		10
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

77.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

78. Aircraft

78.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, add 13 T-7A Destination Cycles in VR-1142 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005315
N_2O	0.001037

Pollutant	Emissions Per Year (TONs)
CO_2	126.395890
CO_2e	126.819485

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005315
N_2O	0.001037

Pollutant	Emissions Per Year (TONs)
CO_2	126.395890
CO_2e	126.819485

78.2 Aircraft & Engines

78.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

78.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

78.3 Flight Operations

78.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 13
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	36
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

78.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

79. Aircraft

79.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1143)

- Activity Description:

In 2037, add 65 T-7A Destination Cycles in VR-1143 with 131 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2037

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.030265
N_2O	0.005905

Pollutant	Emissions Per Year (TONs)
CO_2	719.754372
CO_2e	722.166510

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.030265
N_2O	0.005905

Pollutant	Emissions Per Year (TONs)
CO_2	719.754372
CO_2e	722.166510

79.2 Aircraft & Engines

79.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

79.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

79.3 Flight Operations

79.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 65
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

79.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

80. Aircraft

80.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Add T-7A MTR Destination Cycles (VR-1146)

- Activity Description:
In 2037, add 23 T-7A Destination Cycles in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009925
N_2O	0.001936

Pollutant	Emissions Per Year (TONs)
CO_2	236.047025
CO_2e	236.838097

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009925
N_2O	0.001936

Pollutant	Emissions Per Year (TONs)
CO_2	236.047025
CO_2e	236.838097

80.2 Aircraft & Engines

80.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

80.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

80.3 Flight Operations

80.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		23
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

80.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

81. Aircraft

81.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, add 525 T-7A Destination Cycles in R-5601 Falcon Range with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002344
N_2O	0.000457

Pollutant	Emissions Per Year (TONs)
CO_2	55.749346
CO_2e	55.936181

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002344
N_2O	0.000457

Pollutant	Emissions Per Year (TONs)
CO_2	55.749346
CO_2e	55.936181

81.2 Aircraft & Engines

81.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

81.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

81.3 Flight Operations

81.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		525
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0.4
Climb Out [Intermediate] (mins):	0.43
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

81.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

82. Aircraft

82.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, add 35 T-7A Destination Cycles in Hollis MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005480
N_2O	0.001069

Pollutant	Emissions Per Year (TONs)
CO_2	130.323147
CO_2e	130.759903

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005480
N_2O	0.001069

Pollutant	Emissions Per Year (TONs)
CO_2	130.323147
CO_2e	130.759903

82.2 Aircraft & Engines

82.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

82.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

82.3 Flight Operations

82.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 35
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

82.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

83. Aircraft

83.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, add 1,935 T-7A Destination Cycles in Westover 1 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.363552
N_2O	0.070929

Pollutant	Emissions Per Year (TONs)
CO_2	8646.009920
CO_2e	8674.985594

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.363552
N_2O	0.070929

Pollutant	Emissions Per Year (TONs)
CO_2	8646.009920
CO_2e	8674.985594

83.2 Aircraft & Engines

83.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

83.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

83.3 Flight Operations

83.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		1935
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	5.4
Takeoff [Military] (mins):	7.2
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

83.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

84. Aircraft

84.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, add 494 T-7A Destination Cycles in Westover 2 MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.095931
N_2O	0.018716

Pollutant	Emissions Per Year (TONs)
CO_2	2281.433940
CO_2e	2289.079789

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.095931
N_2O	0.018716

Pollutant	Emissions Per Year (TONs)
CO_2	2281.433940
CO_2e	2289.079789

84.2 Aircraft & Engines

84.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

84.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

84.3 Flight Operations

84.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		131
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		494
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	23.4
Climb Out [Intermediate] (mins):	3.6
Takeoff [Military] (mins):	9
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

84.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)

$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

85. Aircraft

85.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, add 973 T-7A Destination Cycles in Washita MOA with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.179133
N_2O	0.034949

Pollutant	Emissions Per Year (TONs)
CO_2	4260.152413
CO_2e	4274.429610

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.179133
N_2O	0.034949

Pollutant	Emissions Per Year (TONs)
CO_2	4260.152413
CO_2e	4274.429610

85.2 Aircraft & Engines

85.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

85.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

85.3 Flight Operations

85.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 973
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

85.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

86. Aircraft

86.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Bosque, TX; Clay, TX; Comanche, TX; Eastland, TX; Erath, TX; Hamilton, TX; Hood, TX; Jack, TX; Palo Pinto, TX; Somervell, TX; Stephens, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-158)

- Activity Description:
In 2037, remove 5 T-38C Destination Cycles in VR-158 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000872
N_2O	-0.000170

Pollutant	Emissions Per Year (TONs)
CO_2	-20.742274
CO_2e	-20.811788

86.2 Aircraft & Engines

86.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

86.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

86.3 Flight Operations

86.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 5
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0

Takeoff [Military] (mins): 35
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

86.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

87. Aircraft

87.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Cottle, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-159)

- Activity Description:
In 2037, remove 61 T-38C Destination Cycles in VR-159 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010337
N_2O	-0.002017

Pollutant	Emissions Per Year (TONs)
CO_2	-245.825579
CO_2e	-246.649423

87.2 Aircraft & Engines

87.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

87.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

87.3 Flight Operations

87.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 61
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 34
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

87.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)

$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

88. Aircraft

88.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1141)

- Activity Description:
In 2037, remove 6 T-38C Destination Cycles in VR-1141 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001077
N_2O	-0.000210

Pollutant	Emissions Per Year (TONs)
CO_2	-25.601892
CO_2e	-25.687693

88.2 Aircraft & Engines

88.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

88.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

88.3 Flight Operations

88.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

88.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

89. Aircraft

89.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Roger Mills, OK; Baylor, TX; Collingsworth, TX; Cottle, TX; Donley, TX; Foard, TX; Gray, TX; Hall, TX; Hardeman, TX; King, TX; Knox, TX; Motley, TX; Wheeler, TX; Wichita, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1142)

- Activity Description:
In 2037, remove 7 T-38C Destination Cycles in VR-1142 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001256
N_2O	-0.000245

Pollutant	Emissions Per Year (TONs)
CO_2	-29.868875
CO_2e	-29.968975

89.2 Aircraft & Engines

89.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

89.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

89.3 Flight Operations

89.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 7
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 36
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

89.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

90. Aircraft

90.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Archer, TX; Baylor, TX; Callahan, TX; Childress, TX; Cottle, TX; Dickens, TX; Eastland, TX; Foard, TX; Hardeman, TX; Haskell, TX; Jack, TX; Jones, TX; Kent, TX; King, TX; Motley, TX; Palo Pinto, TX; Shackelford, TX; Stephens, TX; Stonewall, TX; Throckmorton, TX; Wichita, TX; Wilbarger, TX; Young, TX

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1143)

- Activity Description:

In 2037, remove 37 T-38C Destination Cycles in VR-1143 with 47 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2037

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.007561
N_2O	-0.001475

Pollutant	Emissions Per Year (TONs)
CO_2	-179.805884
CO_2e	-180.408473

90.2 Aircraft & Engines

90.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

90.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

90.3 Flight Operations

90.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 37
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 41
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

90.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

91. Aircraft

91.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): NOT IN A REGULATORY AREA; Dallas-Fort Worth, TX

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (VR-1146)

- Activity Description:
In 2037, remove 13 T-38C Destination Cycles in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002462
N_2O	-0.000480

Pollutant	Emissions Per Year (TONs)
CO_2	-58.552476
CO_2e	-58.748705

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002462
N_2O	-0.000480

Pollutant	Emissions Per Year (TONs)
CO_2	-58.552476
CO_2e	-58.748705

91.2 Aircraft & Engines

91.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

91.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

91.3 Flight Operations

91.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 13
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

91.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

92. Aircraft

92.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Kiowa, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C Range Destination Cycles (R-5601 Falcon Range)

- Activity Description:
In 2037, remove 299 T-38C Destination Cycles in R-5601 Falcon Range with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000482
N_2O	-0.000094

Pollutant	Emissions Per Year (TONs)
CO_2	-11.469997
CO_2e	-11.508437

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000482
N_2O	-0.000094

Pollutant	Emissions Per Year (TONs)
CO_2	-11.469997
CO_2e	-11.508437

92.2 Aircraft & Engines

92.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R

Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

92.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

92.3 Flight Operations

92.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 299
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0.4
Climb Out [Intermediate] (mins): 0.43
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

92.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

93. Aircraft

93.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Beckham, OK; Greer, OK; Harmon, OK; Jackson, OK; Childress, TX; Collingsworth, TX; Hardeman, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Hollis MOA)

- Activity Description:
In 2037, remove 20 T-38C Destination Cycles in Hollis MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001409
N_2O	-0.000275

Pollutant	Emissions Per Year (TONs)
CO_2	-33.519194
CO_2e	-33.631528

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001409
N_2O	-0.000275

Pollutant	Emissions Per Year (TONs)
CO_2	-33.519194
CO_2e	-33.631528

93.2 Aircraft & Engines

93.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No

Original Aircraft Name:
Original Engine Name:

93.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

93.3 Flight Operations

93.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 20
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 19.5
Climb Out [Intermediate] (mins): 4.5
Takeoff [Military] (mins): 6
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

93.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

94. Aircraft

94.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Archer, TX; Baylor, TX; Foard, TX; Hardeman, TX; Haskell, TX; Knox, TX; Throckmorton, TX; Wilbarger, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 1 MOA)

- Activity Description:
In 2037, remove 1,103 T-38C Destination Cycles in Westover 1 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.093276
N_2O	-0.018198

Pollutant	Emissions Per Year (TONs)
CO_2	-2218.300288
CO_2e	-2225.734555

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.093276
N_2O	-0.018198

Pollutant	Emissions Per Year (TONs)
CO_2	-2218.300288
CO_2e	-2225.734555

94.2 Aircraft & Engines

94.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

94.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

94.3 Flight Operations

94.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1103
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 5.4
Takeoff [Military] (mins): 7.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

94.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

95. Aircraft

95.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Childress, TX; Cottle, TX; Dickens, TX; Foard, TX; Hall, TX; Hardeman, TX; Haskell, TX; Jones, TX; King, TX; Knox, TX; Motley, TX; Shackelford, TX; Stonewall, TX; Throckmorton, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Westover 2 MOA)

- Activity Description:
In 2037, remove 282 T-38C Destination Cycles in Westover 2 MOA with 47 aircraft.

- Activity Start Date
Start Month: 1

Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.025204
N_2O	-0.004917

Pollutant	Emissions Per Year (TONs)
CO_2	-599.395082
CO_2e	-601.403855

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.025204
N_2O	-0.004917

Pollutant	Emissions Per Year (TONs)
CO_2	-599.395082
CO_2e	-601.403855

95.2 Aircraft & Engines

95.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

95.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

95.3 Flight Operations

95.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 47
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 282
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 23.4
Climb Out [Intermediate] (mins): 3.6
Takeoff [Military] (mins): 9
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

95.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

96. Aircraft

96.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Caddo, OK; Comanche, OK; Grady, OK; Kiowa, OK; Washita, OK
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MOA Destination Cycles (Washita MOA)

- Activity Description:
In 2037, remove 555 T-38C Destination Cycles in Washita MOA with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.040018
N_2O	-0.007807

Pollutant	Emissions Per Year (TONs)
CO_2	-951.699979
CO_2e	-954.889444

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.040018
N_2O	-0.007807

Pollutant	Emissions Per Year (TONs)
CO_2	-951.699979
CO_2e	-954.889444

96.2 Aircraft & Engines

96.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

96.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64

After Burn	7695.00	0.13	0.03	3203.44	3214.64

96.3 Flight Operations

96.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		555
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	7.5
Climb Out [Intermediate] (mins):	10
Takeoff [Military] (mins):	7.5
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

96.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

97. Aircraft

97.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Kiowa, OK; Tillman, OK; Archer, TX; Baylor, TX; Clay, TX; Jack, TX; Wichita, TX; Wilbarger, TX; Young, TX
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Destination Cycles (IR-103)

- Activity Description:
In 2037, remove 4 T-38C Destination Cycles in IR-103 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.000399
N_2O	-0.000078

Pollutant	Emissions Per Year (TONs)
CO_2	-9.482182
CO_2e	-9.513960

97.2 Aircraft & Engines

97.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

97.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

97.3 Flight Operations

97.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		47
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		4
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	20
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

97.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

SUA ROI: VR-1146 Low Flight Patterns Only

VR-1146: Alternative 1 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: SHEPPARD AFB
State: Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, VR-1146 Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

f. Point of Contact:

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.063	25	No
NOx	1.033	25	No
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.063	25	No
NOx	1.033	25	No
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.063		
NOx	1.033		
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		

2035

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.307	25	No
NOx	5.140	25	No
CO	-2.052		

SOx	0.090		
PM 10	-0.060		
PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.307	25	No
NOx	5.140	25	No
CO	-2.052		
SOx	0.090		
PM 10	-0.060		
PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.307		
NOx	5.140		
CO	-2.052		
SOx	0.090		
PM 10	-0.060		
PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		

2036

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
Dallas-Fort Worth, TX			
VOC	0.527	25	No
NOx	8.928	25	No
CO	-3.833		
SOx	0.148		
PM 10	-0.114		
PM 2.5	-0.103		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.527	25	No
NOx	8.928	25	No
CO	-3.833		
SOx	0.148		
PM 10	-0.114		
PM 2.5	-0.103		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.527		
NOx	8.928		
CO	-3.833		
SOx	0.148		
PM 10	-0.114		
PM 2.5	-0.103		
Pb	0.000		
NH3	0.000		

2037

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.558	25	No
NOx	9.530	25	No
CO	-4.320		
SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.558	25	No
NOx	9.530	25	No
CO	-4.320		
SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.558		
NOx	9.530		
CO	-4.320		
SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.558	25	No
NOx	9.530	25	No
CO	-4.320		
SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.558	25	No
NOx	9.530	25	No
CO	-4.320		
SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.558		
NOx	9.530		
CO	-4.320		

SOx	0.150		
PM 10	-0.130		
PM 2.5	-0.117		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Carolyn Hein, Contractor	Apr 24 2025
Name, Title	**Date**

VR-1146: Alternative 1 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 1, VR-1146 Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:

Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
3.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)
4.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
5.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)
6.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
7.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
8.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 10 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, remove 9 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 40 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		40
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, remove 45 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 37 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.269080
SO_x	0.126835
NO_x	3.911738
CO	0.222851

Pollutant	Emissions Per Year (TONs)
PM 10	0.018966
PM 2.5	0.016595
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.015967
N_2O	0.003115

Pollutant	Emissions Per Year (TONs)
CO_2	379.727822
CO_2e	381.000417

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.269080
SO_x	0.126835
NO_x	3.911738
CO	0.222851

Pollutant	Emissions Per Year (TONs)
PM 10	0.018966
PM 2.5	0.016595
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.015967
N_2O	0.003115

Pollutant	Emissions Per Year (TONs)
CO_2	379.727822
CO_2e	381.000417

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		37
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 46 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		56
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		46
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 6 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.043635
SO_x	0.020568
NO_x	0.634336
CO	0.036138

Pollutant	Emissions Per Year (TONs)
PM 10	0.003076
PM 2.5	0.002691
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002589
N_2O	0.000505

Pollutant	Emissions Per Year (TONs)
CO_2	61.577485
CO_2e	61.783851

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.043635
SO_x	0.020568
NO_x	0.634336
CO	0.036138

Pollutant	Emissions Per Year (TONs)
PM 10	0.003076
PM 2.5	0.002691
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.002589
N_2O	0.000505

Pollutant	Emissions Per Year (TONs)
CO_2	61.577485
CO_2e	61.783851

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 6
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)

$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, remove 12 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 12
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

VR-1146: Alternative 2 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, VR-1146 Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.112	25	No
NOx	1.420	25	No
CO	0.819		
SOx	0.070		
PM 10	0.034		
PM 2.5	0.030		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.112	25	No
NOx	1.420	25	No
CO	0.819		
SOx	0.070		
PM 10	0.034		
PM 2.5	0.030		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.112		
NOx	1.420		
CO	0.819		
SOx	0.070		
PM 10	0.034		
PM 2.5	0.030		
Pb	0.000		
NH3	0.000		

2035

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.416	25	No
NOx	6.553	25	No
CO	-1.363		
SOx	0.156		
PM 10	-0.031		

PM 2.5	-0.029		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.416	25	No
NOx	6.553	25	No
CO	-1.363		
SOx	0.156		
PM 10	-0.031		
PM 2.5	-0.029		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.416		
NOx	6.553		
CO	-1.363		
SOx	0.156		
PM 10	-0.031		
PM 2.5	-0.029		
Pb	0.000		
NH3	0.000		

2036

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.689	25	No
NOx	11.259	25	No
CO	-3.614		
SOx	0.226		
PM 10	-0.100		
PM 2.5	-0.090		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.689	25	No
NOx	11.259	25	No
CO	-3.614		
SOx	0.226		
PM 10	-0.100		
PM 2.5	-0.090		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.689		
NOx	11.259		
CO	-3.614		
SOx	0.226		
PM 10	-0.100		
PM 2.5	-0.090		
Pb	0.000		
NH3	0.000		

2037

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.732	25	No
NOx	12.065	25	No
CO	-4.219		
SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.732	25	No
NOx	12.065	25	No
CO	-4.219		
SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.732		
NOx	12.065		
CO	-4.219		
SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.732	25	No
NOx	12.065	25	No
CO	-4.219		
SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.732	25	No
NOx	12.065	25	No
CO	-4.219		
SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.732		
NOx	12.065		
CO	-4.219		

SOx	0.231		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Carolyn Hein, Contractor	Apr 24 2025
Name, Title	**Date**

VR-1146: Alternative 2 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 2, VR-1146 Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:

Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
3.	Aircraft	2034: Add T-38C MTR Low-Altitude Operations (VR-1146)
4.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
5.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)
6.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
7.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
8.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 13 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.094542
SO_x	0.044564
NO_x	1.374394
CO	0.078299

Pollutant	Emissions Per Year (TONs)
PM 10	0.006664
PM 2.5	0.005831
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005610
N_2O	0.001095

Pollutant	Emissions Per Year (TONs)
CO_2	133.417884
CO_2e	133.865012

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.094542
SO_x	0.044564
NO_x	1.374394
CO	0.078299

Pollutant	Emissions Per Year (TONs)
PM 10	0.006664
PM 2.5	0.005831
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.005610
N_2O	0.001095

Pollutant	Emissions Per Year (TONs)
CO_2	133.417884
CO_2e	133.865012

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 13
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 17 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.017927
SO_x	0.025575
NO_x	0.045892
CO	0.740723

Pollutant	Emissions Per Year (TONs)
PM 10	0.027009
PM 2.5	0.024141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003220
N_2O	0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	76.568623
CO_2e	76.825230

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.017927
SO_x	0.025575
NO_x	0.045892
CO	0.740723

Pollutant	Emissions Per Year (TONs)
PM 10	0.027009
PM 2.5	0.024141
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003220
N_2O	0.000628

Pollutant	Emissions Per Year (TONs)
CO_2	76.568623
CO_2e	76.825230

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 17
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 50 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.363622
SO_x	0.171399
NO_x	5.286133
CO	0.301149

Pollutant	Emissions Per Year (TONs)
PM 10	0.025630
PM 2.5	0.022426
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.363622
SO_x	0.171399
NO_x	5.286133
CO	0.301149

Pollutant	Emissions Per Year (TONs)
PM 10	0.025630
PM 2.5	0.022426
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.021577
N_2O	0.004210

Pollutant	Emissions Per Year (TONs)
CO_2	513.145706
CO_2e	514.865429

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		50
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2035, remove 57 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.060107
SO_x	-0.085752
NO_x	-0.153873
CO	-2.483601

Pollutant	Emissions Per Year (TONs)
PM 10	-0.090560
PM 2.5	-0.080943
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010795
N_2O	-0.002106

Pollutant	Emissions Per Year (TONs)
CO_2	-256.730088
CO_2e	-257.590477

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.060107
SO_x	-0.085752
NO_x	-0.153873
CO	-2.483601

Pollutant	Emissions Per Year (TONs)
PM 10	-0.090560
PM 2.5	-0.080943
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010795
N_2O	-0.002106

Pollutant	Emissions Per Year (TONs)
CO_2	-256.730088
CO_2e	-257.590477

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17

Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 57
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 46 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.334532
SO_x	0.157687
NO_x	4.863242
CO	0.277057

Pollutant	Emissions Per Year (TONs)
PM 10	0.023579
PM 2.5	0.020632
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019851
N_2O	0.003873

Pollutant	Emissions Per Year (TONs)
CO_2	472.094049
CO_2e	473.676195

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.334532
SO_x	0.157687
NO_x	4.863242
CO	0.277057

Pollutant	Emissions Per Year (TONs)
PM 10	0.023579
PM 2.5	0.020632
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.019851
N_2O	0.003873

Pollutant	Emissions Per Year (TONs)
CO_2	472.094049
CO_2e	473.676195

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		108
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		46
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 58 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.061161
SO_x	-0.087256
NO_x	-0.156572
CO	-2.527173

Pollutant	Emissions Per Year (TONs)
PM 10	-0.092149
PM 2.5	-0.082363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010985
N_2O	-0.002143

Pollutant	Emissions Per Year (TONs)
CO_2	-261.234125
CO_2e	-262.109608

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.061161
SO_x	-0.087256
NO_x	-0.156572
CO	-2.527173

Pollutant	Emissions Per Year (TONs)
PM 10	-0.092149
PM 2.5	-0.082363
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.010985
N_2O	-0.002143

Pollutant	Emissions Per Year (TONs)
CO_2	-261.234125
CO_2e	-262.109608

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 58
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 8 T-7A Low-Altitude Operations in VR-1146 with 108 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.058179
SO_x	0.027424
NO_x	0.845781
CO	0.048184

Pollutant	Emissions Per Year (TONs)
PM 10	0.004101
PM 2.5	0.003588
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.058179
SO_x	0.027424
NO_x	0.845781
CO	0.048184

Pollutant	Emissions Per Year (TONs)
PM 10	0.004101
PM 2.5	0.003588
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.003452
N_2O	0.000674

Pollutant	Emissions Per Year (TONs)
CO_2	82.103313
CO_2e	82.378469

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 108
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 8
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, remove 15 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.015818
SO_x	-0.022566
NO_x	-0.040493
CO	-0.653579

Pollutant	Emissions Per Year (TONs)
PM 10	-0.023832
PM 2.5	-0.021301
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002841
N_2O	-0.000554

Pollutant	Emissions Per Year (TONs)
CO_2	-67.560550
CO_2e	-67.786968

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.015818
SO_x	-0.022566
NO_x	-0.040493
CO	-0.653579

Pollutant	Emissions Per Year (TONs)
PM 10	-0.023832
PM 2.5	-0.021301
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002841
N_2O	-0.000554

Pollutant	Emissions Per Year (TONs)
CO_2	-67.560550
CO_2e	-67.786968

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 15
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

VR-1146: Alternative 3 ACAM Report (Low Flight Patterns)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:
Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

b. Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, VR-1146 Low Flight Pattern

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2034

e. Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2034

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.063	25	No
NOx	1.033	25	No
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.063	25	No
NOx	1.033	25	No
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.063		
NOx	1.033		
CO	-0.332		
SOx	0.021		
PM 10	-0.009		
PM 2.5	-0.008		
Pb	0.000		
NH3	0.000		

2035

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.307	25	No
NOx	5.140	25	No
CO	-2.052		
SOx	0.090		
PM 10	-0.060		

PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.307	25	No
NOx	5.140	25	No
CO	-2.052		
SOx	0.090		
PM 10	-0.060		
PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.307		
NOx	5.140		
CO	-2.052		
SOx	0.090		
PM 10	-0.060		
PM 2.5	-0.054		
Pb	0.000		
NH3	0.000		

2036

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
Dallas-Fort Worth, TX			
VOC	0.556	25	No
NOx	9.351	25	No
CO	-3.809		
SOx	0.162		
PM 10	-0.112		
PM 2.5	-0.101		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.556	25	No
NOx	9.351	25	No
CO	-3.809		
SOx	0.162		
PM 10	-0.112		
PM 2.5	-0.101		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.556		
NOx	9.351		
CO	-3.809		
SOx	0.162		
PM 10	-0.112		
PM 2.5	-0.101		
Pb	0.000		
NH3	0.000		

2037

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.704	25	No
NOx	11.644	25	No
CO	-4.199		
SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.704	25	No
NOx	11.644	25	No
CO	-4.199		
SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.704		
NOx	11.644		
CO	-4.199		
SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		

2038 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dallas-Fort Worth, TX			
VOC	0.704	25	No
NOx	11.644	25	No
CO	-4.199		
SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
Dallas-Fort Worth, TX			
VOC	0.704	25	No
NOx	11.644	25	No
CO	-4.199		
SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		
NOT IN A REGULATORY AREA			
VOC	0.704		
NOx	11.644		
CO	-4.199		

SOx	0.219		
PM 10	-0.120		
PM 2.5	-0.108		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Carolyn Hein, Contractor	Apr 24 2025
Name, Title	**Date**

VR-1146: Alternative 3 ACAM Detail Report (Low Flight Patterns)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: SHEPPARD AFB
State(s): Texas, Oklahoma
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Action Title: T-7A Recapitalization at Sheppard AFB - Alternative 3, VR-1146 Low Flight Pattern

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2034

- Action Purpose and Need:

The purpose of the Proposed Action is to continue the T-7A recapitalization program to prepare pilots to operate modern fourth and fifth generation aircraft. The need for the Proposed Action is to provide infrastructure and training systems to support the newer T-7A aircraft, allow for enhanced and improved flight and simulator training, and ensure DAF pilot training requirements are met. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, requiring a modern, capable training platform with capabilities beyond those available with the T-38C. Additionally, training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The T-7A recapitalization program will allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. T-7A recapitalization at Sheppard AFB would allow DAF to continue the geographically phased T-7A recapitalization sequence, ensuring DAF pilot training requirements are met.

- Action Description:

The Proposed Action is recapitalization of the T-38C flight training program at Sheppard AFB with T-7A aircraft. Recapitalization entails replacement of all T-38C aircraft assigned to Sheppard AFB with T-7A aircraft; transition of aircraft operations at Sheppard AFB and associated SUA from the T-38C to the T-7A; temporary changes to the number of personnel and dependents in the Sheppard AFB region; and construction of and upgrades to operations, support, and maintenance facilities to support pilot training and aircraft operation and maintenance.

For Alternative 1, Sheppard AFB would receive up to 108 T-7A aircraft and perform sufficient operations for sustaining pilot training while simultaneously phasing out the T 38C aircraft. Alternative 2 would also result in up to 108 T-7A aircraft being delivered to Sheppard AFB; however, T-7A operations would be performed at an operational tempo approximately 25 percent greater than Alternative 1 to cover a scenario in which DAF requires a surge or increase in pilot training operations above the current plan. For Alternative 3, Sheppard AFB would receive up to 131 T-7A aircraft and T-7A operations would be approximately 22 percent greater than aircraft operations for Alternative 1. The No Action Alternative would not implement T-7A recapitalization at Sheppard AFB.

- Point of Contact

Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email:

Phone Number:

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	2034: Add T-7A MTR Low-Altitude Operations (VR-1146)
3.	Aircraft	2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)
4.	Aircraft	2035: Add T-7A MTR Low-Altitude Operations (VR-1146)
5.	Aircraft	2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)
6.	Aircraft	2036: Add T-7A MTR Low-Altitude Operations (VR-1146)
7.	Aircraft	2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)
8.	Aircraft	2037: Add T-7A MTR Low-Altitude Operations (VR-1146)
9.	Aircraft	2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, add 10 T-7A Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.072724
SO_x	0.034280
NO_x	1.057227
CO	0.060230

Pollutant	Emissions Per Year (TONs)
PM 10	0.005126
PM 2.5	0.004485
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.004315
N_2O	0.000842

Pollutant	Emissions Per Year (TONs)
CO_2	102.629141
CO_2e	102.973086

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 10
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2034: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2034, remove 9 T-38C Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2034

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.009491
SO_x	-0.013540
NO_x	-0.024296
CO	-0.392147

Pollutant	Emissions Per Year (TONs)
PM 10	-0.014299
PM 2.5	-0.012781
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.001704
N_2O	-0.000333

Pollutant	Emissions Per Year (TONs)
CO_2	-40.536330
CO_2e	-40.672181

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 9
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2035, add 40 T-7A Low-Altitude Operations in VR-1146 with 76 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.290897
SO_x	0.137119
NO_x	4.228906
CO	0.240919

Pollutant	Emissions Per Year (TONs)
PM 10	0.020504
PM 2.5	0.017941
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017262
N_2O	0.003368

Pollutant	Emissions Per Year (TONs)
CO_2	410.516565
CO_2e	411.892343

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	T-7A
Engine Model:	F404-GE-102
Primary Function:	Trainer
Aircraft has After burn:	Yes
Number of Engines:	1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate?	No
Original Aircraft Name:	
Original Engine Name:	

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		76
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		40
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2035: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2035, remove 45 T-38C Low-Altitude Operations in VR-1146 with 28 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2035

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.047453
SO_x	-0.067699
NO_x	-0.121478
CO	-1.960737

Pollutant	Emissions Per Year (TONs)
PM 10	-0.071495
PM 2.5	-0.063903
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008522
N_2O	-0.001663

Pollutant	Emissions Per Year (TONs)
CO_2	-202.681649
CO_2e	-203.360903

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17

Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 28
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 45
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, add 41 T-7A Low-Altitude Operations in VR-1146 with 124 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.298170
SO_x	0.140547
NO_x	4.334629
CO	0.246942

Pollutant	Emissions Per Year (TONs)
PM 10	0.021016
PM 2.5	0.018389
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017693
N_2O	0.003452

Pollutant	Emissions Per Year (TONs)
CO_2	420.779479
CO_2e	422.189652

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.298170
SO_x	0.140547
NO_x	4.334629
CO	0.246942

Pollutant	Emissions Per Year (TONs)
PM 10	0.021016
PM 2.5	0.018389
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.017693
N_2O	0.003452

Pollutant	Emissions Per Year (TONs)
CO_2	420.779479
CO_2e	422.189652

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		124
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		41
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2036: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2036, remove 46 T-38C Low-Altitude Operations in VR-1146 with 56 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2036

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.048507
SO_x	-0.069203
NO_x	-0.124178
CO	-2.004309

Pollutant	Emissions Per Year (TONs)
PM 10	-0.073084
PM 2.5	-0.065323
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.008712
N_2O	-0.001700

Pollutant	Emissions Per Year (TONs)
CO_2	-207.185685
CO_2e	-207.880034

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 56
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 46
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	0
Climb Out [Intermediate] (mins):	0
Takeoff [Military] (mins):	38
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft

NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX
Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Add T-7A MTR Low-Altitude Operations (VR-1146)

- Activity Description:
In 2037, add 22 T-7A Low-Altitude Operations in VR-1146 with 131 aircraft.

- Activity Start Date
Start Month: 1
Start Year: 2037

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.159994
SO_x	0.075415
NO_x	2.325898
CO	0.132506

Pollutant	Emissions Per Year (TONs)
PM 10	0.011277
PM 2.5	0.009867
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009494
N_2O	0.001852

Pollutant	Emissions Per Year (TONs)
CO_2	225.784111
CO_2e	226.540789

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.159994
SO_x	0.075415
NO_x	2.325898
CO	0.132506

Pollutant	Emissions Per Year (TONs)
PM 10	0.011277
PM 2.5	0.009867
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.009494
N_2O	0.001852

Pollutant	Emissions Per Year (TONs)
CO_2	225.784111
CO_2e	226.540789

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-7A
Engine Model: F404-GE-102
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)
Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors.

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 131
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 22
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County(s): Atoka, OK; Bryan, OK; Carter, OK; Coal, OK; Garvin, OK; Grady, OK; Jefferson, OK; Johnston, OK; Love, OK; Marshall, OK; Murray, OK; Pontotoc, OK; Stephens, OK; Clay, TX; Cooke, TX; Denton, TX; Grayson, TX; Jack, TX; Montague, TX; Wise, TX

Regulatory Area(s): Dallas-Fort Worth, TX; Dallas-Fort Worth, TX; NOT IN A REGULATORY AREA

- Activity Title: 2037: Remove T-38C MTR Low-Altitude Operations (VR-1146)

- Activity Description:

In 2037, remove 12 T-38C Low-Altitude Operations in VR-1146 with 47 aircraft.

- Activity Start Date

Start Month: 1
Start Year: 2037

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.012654
SO_x	-0.018053
NO_x	-0.032394
CO	-0.522863

Pollutant	Emissions Per Year (TONs)
PM 10	-0.019065
PM 2.5	-0.017041
Pb	0.000000
NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.002273
N_2O	-0.000443

Pollutant	Emissions Per Year (TONs)
CO_2	-54.048440
CO_2e	-54.229574

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: T-38C
Engine Model: J85-GE-5R
Primary Function: Trainer
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Idle	520.00	16.80	1.07	1.08	177.45	4.70	4.23
Approach	689.00	7.96	1.07	0.84	119.23	2.42	2.17
Intermediate	1030.00	2.78	1.07	0.70	65.07	1.79	1.61
Military	2220.00	0.75	1.07	1.92	30.99	1.13	1.01
After Burn	7695.00	6.97	1.07	6.23	53.43	0.25	0.23

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH_4	N_2O	CO_2	CO_2e
Idle	520.00	0.13	0.03	3203.44	3214.64
Approach	689.00	0.13	0.03	3203.44	3214.64
Intermediate	1030.00	0.13	0.03	3203.44	3214.64
Military	2220.00	0.13	0.03	3203.44	3214.64
After Burn	7695.00	0.13	0.03	3203.44	3214.64

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 47
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 12
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 38
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)