DRAFT | November 2023

Environmental Impact Statement
Volume 2

B-21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

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PRIVACY ADVISORY

This Draft Environmental Impact Statement (EIS) is provided in accordance with the National Environmental Policy Act, the President's Council on Environmental Quality NEPA Regulations (40 Code of Federal Regulations 1500–1508), and 32 Code of Federal Regulations 989, Environmental Impact Analysis Process.

The Environmental Impact Analysis Process provides an opportunity for public input on Air Force decision making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better informed decisions. Letters or other written or oral comments provided may be published in the EIS. As required by law, comments provided will be addressed in the EIS and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify a desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EIS or associated documents. Private addresses were compiled to develop a mailing list for those requesting copies of the EIS. However, only the names of the individuals making comments and specific comments are disclosed. Personal home addresses and phone numbers will not be published in the Final EIS. If you choose to not provide personal identifying information, your comments will be given the same weight and consideration as any other comments submitted.

Information regarding the Draft EIS is available on the website at www.B21EIS.com.

Please direct any requests for information or other inquiries to:
Dyess AFB Public Affairs, (325) 696-4820
7bwpa@us.af.mil
or
Whiteman AFB Public Affairs, (660) 687-5727
509bw.public.affairs@us.af.mil

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ACRONYMS AND ABBREVIATIONS

ACAM	Air Conformity Applicability Model
AFB	Air Force Base
AICUZ	Air Installations Compatible Use Zones
APZs	Accident Potential Zones
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZs	Clear Zones
dB	decibels
dBA	A-weighted decibels
DNL	day-night average sound level
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ICEMAP	Installation Complex Encroachment Management Action Plan
MAZ	Military Airport Zone
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NOI	Notice of Intent
PSD	Prevention of Significant Deterioration
ROI	Region of Influence
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
VOC	volatile organic compound

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APPENDIX A

PUBLIC INVOLVEMENT

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A. PUBLIC INVOLVEMENT AND AGENCY OUTREACH

A.1 NOTICE OF INTENT (NOI)

A.1.1 Federal Register NOI (March 27, 2023)

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

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The Commission believes requiring such information in large trader reports would be costly for respondents to implement and receiving such information in periodic reports would not have any practical use for the Commission in conducting effective market surveillance.

Burden Statement: The respondent burden for this collection is estimated to be 0.25 hour per response, on average. These estimates include the time to locate the information related to the exemptions and to file necessary exemption paperwork. There are approximately 72,644 responses annually, thus the estimated total annual burden on respondents is 18,512 hours.

Respondents/Affected Entities: Large Traders, Clearing Members, Contract Markets, and other entities affected by Commission regulations 16.00 and 17.00 as well as part 21.

Estimated Number of Respondents: 350.

Estimated Average Burden Hours per Respondent: 52.9.

Estimated Total Annual Burden Hours: 18,152.

Frequency of Collection: Periodically.

There are no capital costs or operating and maintenance costs associated with this collection.

(Authority: 44 U.S.C. 3501 *et seq.*)

Dated: March 22, 2023.

Robert Sidman,

Deputy Secretary of the Commission.

[FR Doc. 2023–06247 Filed 3–24–23; 8:45 am]

BILLING CODE 6351–01–P

DEPARTMENT OF DEFENSE

Department of the Air Force

Notice of Intent To Prepare an Environmental Impact Statement for the B–21 Beddown Main Operating Base 2 (Mob 2)/Main Operating Base 3 (Mob 3) at Dyess Air Force Base, Texas or Whiteman Air Force Base, Missouri

AGENCY: Department of the Air Force, Department of Defense.

ACTION: Notice of intent.

SUMMARY: The Department of the Air Force (DAF) is issuing this Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) to assess the potential environmental impacts associated with the beddown of the B–21 Main Operating Base 2 (MOB 2)/Main Operating Base 3 (MOB 3) at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri. The EIS will evaluate the potential impacts of the DAF's beddown proposal associated with infrastructure construction, demolition, renovations, additional personnel, and changes in aircraft operations at Dyess AFB and Whiteman AFB, including associated airspace. The B–21 will eventually replace existing B–1 and B–2 bomber aircraft.

DATES: A public scoping period of 45 days will take place starting from the date of this NOI publication in the **Federal Register**. This scoping period will be conducted in compliance with NEPA and section 106 consultation pursuant to *Code of Federal Regulations* title 36, section 800.2(d). Please provide substantive comments which identify potential alternatives (in accordance with 40 CFR 1502.14(a) and 32 CFR 989.8), information, and analyses relevant to the proposed action. Comments will be accepted at any time during the environmental impact analysis process; however, to ensure DAF has sufficient time to consider public scoping comments during preparation of the Draft EIS, please submit comments within the 45-day scoping period. Scoping comments should be submitted to the website or the address listed below by May 8, 2023. The Draft EIS is anticipated in Fall 2023 and the Final EIS is anticipated in Summer 2024. The Record of Decision would be approved and signed no earlier than 30 days after the Final EIS.

The DAF intends to hold scoping meetings from 5:30 p.m. to 7:30 p.m. CST in the following communities on the following dates:

1. Virtual—Tuesday, April 11, 2023, via Zoom. Visit *www.B21EIS.com* for registration and meeting links. To listen only, dial in by phone at 888–788–0099, Webinar ID: 813 5934 9395, Passcode: 570587
2. Virtual—Thursday, April 13, 2023, via Zoom. Visit *www.B21EIS.com* for registration and meeting links. To listen only, dial in by phone at 888–788–0099, Webinar ID: 813 5934 9395, Passcode: 570587
3. Whiteman AFB—Tuesday, April 18, 2023, at the University of Central Missouri, 108 W. South St., Warrensburg, MO
4. Whiteman AFB—Thursday, April 20, 2023, at the Knob Noster High School, 504 South Washington Ave., Knob Noster, MO
5. Dyess AFB—Tuesday, April 25, 2023, at the Abilene Convention Center, 1100 N 6th St., Abilene, TX
6. Dyess AFB—Thursday, April 27, 2023, at the Tye Community Center, 103 Scott St., Tye, TX

ADDRESSES: Additional information on the B–21 MOB 2/MOB 3 Beddown EIS environmental impact analysis process can be found on the project website at *www.B21EIS.com*. The project website can also be used to submit comments. Comments-by-mail regarding the proposal should be sent to Leidos, ATTN: B–21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560. Inquiries regarding the proposal should be directed to Dyess AFB Public Affairs, ATTN: B–21 EIS, 7 Lancer Loop, Suite 136, Dyess AFB, TX 79607; (325) 696–4820; *7bwpa@us.af.mil;* or Whiteman AFB Public Affairs, ATTN: B–21 EIS, 509 Spirit Blvd., Bldg. 509, Suite 116, Whiteman AFB, MO 65305; (660) 687–5727; *509bw.public.affairs@us.af.mil.* For printed material requests, the standard U.S. Postal Service shipping timeline will apply.

SUPPLEMENTARY INFORMATION: The beddown of the B–21 will take place through a series of beddowns at three Main Operating Bases (MOBs), referred to as MOB 1, MOB 2, and MOB 3. The candidate MOB locations were determined through the DAF's Strategic Basing Process (Air Force Instruction [AFI] 10–503, Strategic Basing), which identified Dyess AFB in Texas, Ellsworth AFB in South Dakota, and Whiteman AFB in Missouri as potential installations to beddown the B–21 Raider. The B–21 will operate under the direction of the Air Force Global Strike Command.

The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the United States bomber fleet capabilities. The B–21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties. MOB 2 will support training of crewmembers and personnel in the operation and maintenance of the B–21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B–21 training and operations.

In 2021, the DAF completed the B–21 MOB 1 Beddown at Dyess, AFB Texas or Ellsworth AFB, South Dakota EIS (hereinafter referred to as the "MOB 1 EIS"). On June 3, 2021, the DAF signed a Record of Decision (ROD) for the MOB 1 EIS and selected Ellsworth AFB as the MOB 1 location. Because the DAF chose Ellsworth AFB for MOB 1, the EIS for MOB 2/MOB 3 will evaluate potential environmental consequences associated with the remaining two alternative bases: Dyess AFB or Whiteman AFB.

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The proposed beddown would include B–21 Operations Squadrons, Weapons Instructor Course (WIC), and Operational Test and Evaluation (OT&E) Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (*i.e.,* Operations Squadrons, WIC, OT&E, and WGF) will be analyzed for both alternative locations, Dyess AFB and Whiteman AFB.

The EIS will analyze Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B–21 beddown strategy. At Dyess AFB, proposed activities include an estimated 4.2 million square feet (SF) of construction, 600,000 SF of renovation, and 300,000 SF of demolition. Proposed airspace for B–21 operations out of Dyess AFB include special use airspace (SUA) units over areas in Texas and New Mexico. At Whiteman AFB, proposed activities include an estimated 600,000 SF of construction, 1.7 million SF of renovation, and 85,000 SF of demolition. Proposed airspace for B–21 operations out of Whiteman AFB include SUA units over areas in Missouri and Kansas. The potential impacts of the alternatives and the No Action Alternative that the EIS may examine include impacts to land use, airspace, safety, noise, hazardous materials and solid waste, physical resources (including earth and water resources), air quality, transportation, cultural resources, biological resources, socioeconomics, and environmental justice.

The DAF is preparing this EIS in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500 through 1508 (85 FR 43359, July 16, 2020, as amended by 87 FR 23453, April 20, 2022), the Council on Environmental Quality (CEQ) regulations implementing NEPA; and the DAF's Environmental Impact Analysis Process (EIAP) as codified in 32 CFR part 989. Since the B–21 basing action is a series of beddowns, once a base is selected for MOB 2, the remaining base would subsequently become the MOB 3 beddown location.

DAF anticipates potential noise impacts to be similar to, or less than, those currently experienced at Dyess AFB and Whiteman AFB, including associated airspace.

Potential permits that may be required include, but are not limited to, section 404 of the Clean Water Act, General Construction, Floodplain Development, and National Pollutant Discharge Elimination System. Additionally, the DAF will coordinate with U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act, as well as SHPO and federally recognized tribes regarding section 106 consultation under the National Historic Preservation Act and will utilize the scoping process to partially fulfill consultation requirements.

Scoping and Agency Coordination: The scoping process will be used to involve the public early in the planning and development of the EIS and help identify issues to be addressed in the environmental analysis. To effectively define the full range of issues and concerns to be evaluated in the EIS, the DAF is soliciting scoping comments from interested local, state, and federal agencies (including, but not limited to U.S. Army Corps of Engineers, State Historic Preservation Offices (SHPO), and U.S. Fish and Wildlife Service) and interested members of the public.

The proposed action at Dyess AFB and Whiteman AFB is subject to the Clean Water Act, sections 401, 404 and 404(b)(1) guidelines and have the potential to be located in a floodplain and/or wetland. Consistent with the requirements and objectives of Executive Order (E.O.) 11990, "Protection of Wetlands", and E.O. 11988, "Floodplain Management", as amended by E.O. 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," state and federal regulatory agencies with special expertise in wetlands and floodplains will be contacted to request comment. Consistent with E.O. 11988, E.O. 13690, and E.O. 11990, this NOI initiates early public review of the proposed actions and alternatives, which have the potential to be located in a floodplain and/or wetland.

The DAF will hold scoping meetings to inform the public and solicit comments and concerns about the proposal. Scheduled dates, and times for each meeting, as well as registration information for virtual meetings, will be available on the project website (*www.B21EIS.com*) and published in the local media a minimum of fifteen (15) days prior to each meeting.

Tommy W. Lee,

Acting Air Force Federal Register Liaison Officer.

[FR Doc. 2023–06175 Filed 3–24–23; 8:45 am]

BILLING CODE 5001–10–P

DEPARTMENT OF DEFENSE

Office of the Secretary

Defense Advisory Committee on Investigation, Prosecution, and Defense of Sexual Assault in the Armed Forces; Notice of Federal Advisory Committee Meeting

AGENCY: General Counsel of the Department of Defense, Department of Defense (DoD).

ACTION: Notice of Federal Advisory Committee meeting.

SUMMARY: The DoD is publishing this notice to announce that the following Federal Advisory Committee meeting of the Defense Advisory Committee on Investigation, Prosecution, and Defense of Sexual Assault in the Armed Forces (DAC–IPAD) will take place.

DATES: Thursday, March 30, 2023—Open to the public from 12:30 p.m. to 1:30 p.m. EST.

ADDRESSES: This public meeting will be held virtually. To receive meeting access, please submit your name, affiliation/organization, telephone number, and email contact information to the Committee at: *whs.pentagon.em.mbx.dacipad@mail.mil.*

FOR FURTHER INFORMATION CONTACT: Dwight Sullivan, 703–695–1055 (Voice), 703–693–3903 (Facsimile), *dwight.h.sullivan.civ@mail.mil* (Email). Mailing address is DAC–IPAD, One Liberty Center, 875 N. Randolph Street, Suite 150, Arlington, Virginia 22203. Website: *http://dacipad.whs.mil/*. The most up-to-date changes to the meeting agenda can be found on the website.

SUPPLEMENTARY INFORMATION: Due to circumstances beyond the control of the Designated Federal Officer (DFO), the Defense Advisory Committee on Investigation, Prosecution, and Defense of Sexual Assault in the Armed Forces was unable to provide public notification required by 41 CFR 102–3.150(a) concerning its March 30, 2023 meeting. Accordingly, the Advisory Committee Management Officer for the Department of Defense, pursuant to 41 CFR 102–3.150(b), waives the 15-calendar day notification requirement. This meeting is being held under the provisions of chapter 10 of title 5 of the United States Code (U.S.C.) (formerly the Federal Advisory Committee Act (FACA) of 1972 (5 U.S.C., app.)), the Government in the Sunshine Act of 1976 (5 U.S.C. 552b, as amended), and 41 CFR 102–3.140 and 102–3.150.

Purpose of the Meeting: In section 546 of the National Defense Authorization

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A.2 MAILING LISTS

A.2.1 Dyess AFB Mailing Lists

A.2.1.1 Agency and Interested Parties Mailing List

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
U.S. House of Representatives	Texas, 11th District	Congressman	August	Pfluger
U.S. House of Representatives	Texas, 19th District	Congressman	Jodey	Arrington
U.S. House of Representatives	New Mexico, District 2	Congresswoman	Yvette	Herrell
U.S. Senate	Texas	Senator	Ted	Cruz
U. S. Senator Ted Cruz	Texas	Ms.	Mary	Owen
U.S. Senate	Texas	Senator	John	Cornyn
U.S. Senate	New Mexico	Senator	Martin	Heinrich
U.S. Senator Martin Heinrich	New Mexico	Ms.	Diane	Ventura
U.S. Senate	New Mexico	Senator	Ben	Luján
State of Texas	Office of the Governor	Governor	Greg	Abbott
State of Texas	Governor's Office of Budget and Planning	Ms.	Denise S.	Francis
Texas House of Representatives	District 59	Congresswoman	Shelby	Slawson
Texas House of Representatives	District 60	Congressman	Glenn	Rogers
Texas House of Representatives	District 68	Congressman	David	Spiller
Texas House of Representatives	District 71	Congressman	Stan	Lambert
Texas House of Representatives	District 72	Congressman	Drew	Darby
Texas House of Representatives	District 81	Congressman	Brooks	Landgraf
Texas House of Representatives	District 82	Congressman	Tom	Craddick
Texas House of Representatives	District 83	Congressman	Dustin	Burrows
Texas House of Representatives	District 88	Congressman	Tracy O.	King
Texas Senate	District 24	Senator	Dawn	Buckingham

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Texas Senate	District 28	Senator	Charles	Perry
Texas Senate	District 28	Senator	Charles	Perry
Texas Senate	District 28, Office of Senator Charles Perry	Congresswoman	Laura	Lewis
Texas Senate	District 30	Senator	Drew	Springer
Texas Senate	District 31	Senator	Kel	Seliger
Texas Senate	District 31	Senator	Kel	Seliger
State of New Mexico	Office of the Governor	Governor	Michelle Lujan	Grisham
New Mexico House of Representatives	District 61	Congressman	Randall	Pettigrew
New Mexico House of Representatives	District 63	Congressman	Martin R.	Zamora
New Mexico House of Representatives	District 66	Congressman	Phelps	Anderson
New Mexico Senate	District 27	Senator	Stuart	Ingle
New Mexico Senate	District 41	Senator	David	Gallegos
Taylor County Commission	--	Commissioner	Randall D.	Williams
Taylor County Commission	--	Commissioner	Kyle	Kedrick
Taylor County Commission	--	Commissioner	Brad	Birchum
Taylor County Commission	--	Commissioner	Chuck	Statler
Taylor County Commission	--	Judge	Phil	Crowley
City of Abilene	--	Mayor	Anthony	Williams
City of Abilene	--	Councilman	Shane	Price
City of Abilene	--	Councilman	Lynn	Beard
City of Abilene	--	Councilwoman	Donna	Albus
City of Abilene	--	Councilman	Weldon W.	Hurt
City of Abilene	--	Councilman	Travis	Craver
City of Baird	--	Mayor	Donny	Smith
City of Baird	--	Councilmember	Jim	Dobbs
City of Baird	--	Councilmember	David	Parkhill
City of Baird	--	Councilmember	Laverne	Mason
City of Baird	--	Councilmember	Deborah	Moorehead
City of Baird	--	Councilmember	Hector	Aguirre
City of Clyde	--	Mayor Pro-Tem	Paul	McGuire

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
City of Clyde	--	Mayor	Rodger	Brown
City of Clyde	--	Councilmember	Tammie	Coffman
City of Clyde	--	Councilmember	Jim	Rector
City of Clyde	--	Councilmember	Thomas	Martin
City of Clyde	--	Councilmember	Danny	White
City of Merkel	--	Mayor	Mary	Schrampfer
City of Merkel	--	Councilmember	Gary	Hicks
City of Merkel	--	Councilmember	Larry	Hewitt
City of Merkel	--	Councilmember	Brady	Rutledge
City of Merkel	--	Councilmember	Joseph	Wilson
City of Tye	--	Mayor	Nancy	Moore
City of Tye	--	Councilman	Edward	Romero
City of Tye	--	Councilman	Kenny	Dry
City of Tye	--	Councilman	Jerry	Perkins
City of Tye	--	Councilman	Bobby	Votaw
City of Tye	--	Councilman	Jim	Creager
Town of Buffalo Gap	--	Mayor	Jerrod	Jones
Town of Buffalo Gap	--	Alderman	James	Mabes
Town of Buffalo Gap	--	Alderman	Mickey	Stewart
Town of Buffalo Gap	--	Alderman	Ben	Gates
Town of Buffalo Gap	--	Alderman	James Clyde	Mabes
Town of Buffalo Gap	--	Alderman	Pete	Renick
City of Abilene	--	Mr.	Stanley	Smith
City of Abilene	--	Mr.	Robert	Hanna
City of Abilene	--	Mr.	Michael	Warrix
City of Merkel	--	Councilmember	Matthew	Riggan
Andrews County	--	Ms.	Vicki	Scott
Andrews County Commissioners' Court	--	Judge	Charlie	Falcon
Andrews County Commissioners' Court	--	Commissioner	Kerry	Pack
Andrews County Commissioners' Court	--	Commissioner	Mark	Savell

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Andrews County Commissioners’ Court	--	Commissioner	Jeneane	Anderegg
Andrews County Commissioners’ Court	--	Commissioner	Jim	Waldrop
Borden County	--	Ms.	Jana	Underwood
Borden County Commissioners’ Court	--	Judge	Ross D.	Sharp
Borden County Commissioners’ Court	--	Commissioner	Norman “Jibber”	Herridge
Borden County Commissioners’ Court	--	Commissioner	Randy	Adcock
Borden County Commissioners’ Court	--	Commissioner	Ernest	Reyes
Borden County Commissioners’ Court	--	Commissioner	Greg	Stansell
Brown County	--	Ms.	Sharon	Ferguson
Brown County Commissioners’ Court	--	Judge	Paul	Lilly
Brown County Commissioners’ Court	--	Commissioner	Gary	Worley
Brown County Commissioners’ Court	--	Commissioner	Joel	Kelton
Brown County Commissioners’ Court	--	Commissioner	Wayne	Shaw
Brown County Commissioners’ Court	--	Commissioner	Larry	Traweek
Callahan County	--	Ms.	Nicole	Crocker
Callahan County Commissioners’ Court	--	Judge	G. Scott	Kniffen
Callahan County Commissioners’ Court	--	Commissioner	Rick	McGowen
Callahan County Commissioners’ Court	--	Commissioner	Bryan	Farmer
Callahan County Commissioners’ Court	--	Commissioner	Tom	Windham
Callahan County Commissioners’ Court	--	Commissioner	Erwin	Clark
Chaves County	--	Mr.	Cindy	Fuller
Chaves County Commission	--	Commissioner	Dara	Dana
Chaves County Commission	--	Commissioner	T. Calder	Ezzell Jr.

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Chaves County Commission	--	Commissioner	Jeff	Bilberry
Chaves County Commission	--	Commissioner	Richard	Taylor
Chaves County Commission	--	Commissioner	Will	Cavin
Cochran County	--	Commissioner	Lisa	Smith
Cochran County Commissioners' Court	--	Commissioner	Pat Sabala	Henry
Cochran County Commissioners' Court	--	Commissioner	Timothy	Roberts
Cochran County Commissioners' Court	--	Commissioner	Matt	Evans
Cochran County Commissioners' Court	--	Commissioner	Eric	Silhan
Cochran County Commissioners' Court	--	Commissioner	Reynaldo	Morin
Coleman County	--	Ms.	Stacey	Mendoza
Coleman County Commissioners' Court	--	Judge	Billy D.	Bledsoe
Coleman County Commissioners' Court	--	Commissioner	Matt	Henderson
Coleman County Commissioners' Court	--	Commissioner	Jim	Rice
Coleman County Commissioners' Court	--	Commissioner	Scotty	Lawrence
Coleman County Commissioners' Court	--	Commissioner	Alan	Davis
Comanche County	--	Ms.	Ruby	Lesley
Comanche County Commissioners' Court	--	Judge	Stephanie L.	Davis
Comanche County Commissioners' Court	--	Commissioner	Gary Corky	Underwood
Comanche County Commissioners' Court	--	Commissioner	Russell	Gillette
Comanche County Commissioners' Court	--	Commissioner	Sherman	Sides
Comanche County Commissioners' Court	--	Commissioner	Jimmy Dale	Johnson
Concho County	--	Ms.	Phyllis F.	Lovell
Concho County Commissioners' Court	--	Judge	David	Dillard

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Concho County Commissioners' Court	--	Commissioner	Trey	Bradshaw
Concho County Commissioners' Court	--	Commissioner	Ralph	Willberg
Concho County Commissioners' Court	--	Commissioner	Gary	Gierisch
Concho County Commissioners' Court	--	Commissioner	Aaron "Sonny"	Browning
Dawson County	--	Ms.	Clare	Christy
Dawson County Commissioners' Court	--	Judge	Foy	O'Brien
Dawson County Commissioners' Court	--	Commissioner	Mark	Shofner
Dawson County Commissioners' Court	--	Commissioner	Martha	Hernandez
Dawson County Commissioners' Court	--	Commissioner	Nicky	Goode
Dawson County Commissioners' Court	--	Commissioner	Russell	Cox
De Baca County	--	Mr.	Jeffrey Barfield	Hromas
De Baca County Commission	--	Commissioner	Joe	Steele
De Baca County Commission	--	Commissioner	Marshall	Stinnett
De Baca County Commission	--	Commissioner	William	West
Eastland County	--	Ms.	Cathy	Jentho
Eastland County Commissioners' Court	--	Judge	Rex	Fields
Eastland County Commissioners' Court	--	Commissioner	Andy	Maxwell
Eastland County Commissioners' Court	--	Commissioner	James	Crenshaw
Eastland County Commissioners' Court	--	Commissioner	Ronnie	Wilson
Eastland County Commissioners' Court	--	Commissioner	Robert	Rains
Erath County	--	Ms.	Gwinda	Jones
Erath County	--	Judge	Alfonso	Campos
Erath County	--	Commissioner	Dee	Stephens
Erath County	--	Commissioner	Albert	Ray

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Erath County	--	Commissioner	Joe	Brown
Erath County	--	Commissioner	Jim	Buck
Fisher County	--	Mr.	Pat	Thomson
Fisher County Commissioners' Court	--	Judge	Ken	Holt
Fisher County Commissioners' Court	--	Commissioner	Gordon	Pippin
Fisher County Commissioners' Court	--	Commissioner	Dexter	Elrod
Fisher County Commissioners' Court	--	Commissioner	Preston	Martin
Fisher County Commissioners' Court	--	Commissioner	Kevin	Stuart
Gaines County	--	Ms.	Terri	Berry
Gaines County Commissioners' Court	--	Judge	Tom	Keyes
Gaines County Commissioners' Court	--	Commissioner	Brian	Rosson
Gaines County Commissioners' Court	--	Commissioner	Craig	Belt
Gaines County Commissioners' Court	--	Commissioner	David	Murphree
Gaines County Commissioners' Court	--	Commissioner	Biz	Houston
Garza County	--	Mr.	Jim	Plummer
Garza County	--	Judge	Lee	Norman
Garza County	--	Commissioner	Jeff	Williams
Garza County	--	Commissioner	Charles	Morris
Garza County	--	Commissioner	Ted	Brannon
Garza County	--	Commissioner	Jerry	Benham
Guadalupe County	--	Mr.	Robert	Serrano III
Guadalupe County	--	Commissioner	Albert E.	Campos Jr.
Guadalupe County	--	Commissioner	James E.	Moncayo
Guadalupe County	--	Commissioner	Ernest E.	Chavez
Hockley County	--	Ms.	Jennifer	Palermo
Hockley County Commissioners' Court	--	Judge	Sharla	Baldridge
Hockley County Commissioners' Court	--	Commissioner	Alan	Wisdom

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Hockley County Commissioners' Court	--	Commissioner	Larry	Carter
Hockley County Commissioners' Court	--	Commissioner	Seth	Graf
Hockley County Commissioners' Court	--	Commissioner	Tommy	Clevenger
Howard County	--	Mr.	Brent	Zitterkopf
Howard County Commissioners' Court	--	Judge	Kathryn G.	Wiseman
Howard County Commissioners' Court	--	Commissioner	Eddilisa	Ray
Howard County Commissioners' Court	--	Commissioner	Craig	Bailey
Howard County Commissioners' Court	--	Commissioner	Jimmie	Long
Howard County Commissioners' Court	--	Commissioner	John	Cline
Kent County	--	Mr.	Richard Craig	Harrison
Lea County	--	Mr.	Keith	Manes
Lea County	--	Commissioner	Dean	Jackson
Lea County	--	Commissioner	Rebecca	Long
Lea County	--	Commissioner	Gary	Eidson
Lea County	--	Commissioner	Jonathan	Sena
Lea County	--	Commissioner	Pat	Sims
Lincoln County	--	Ms.	Whitney	Whittaker
Lincoln County	--	Judge	Rhonda	Burrows
Lincoln Board of County Commissioners	--	Commissioner	Todd	Proctor
Lincoln Board of County Commissioners	--	Commissioner	Lynn	Willard
Lincoln Board of County Commissioners	--	Commissioner	Jon	Crunk
Lincoln Board of County Commissioners	--	Commissioner	Tom	Stewart
Lincoln Board of County Commissioners	--	Commissioner	Elaine	Allen
Lynn County	--	Ms.	Karen	Strickland
Lynn County Commissioners' Court	--	Judge	Mike	Braddock

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Lynn County Commissioners' Court	--	Commissioner	Matt	Woodley
Lynn County Commissioners' Court	--	Commissioner	John	Hawthorne
Lynn County Commissioners' Court	--	Commissioner	Don	Blair
Lynn County Commissioners' Court	--	Commissioner	Larry	Durham
Martin County	--	Ms.	Linda	Gonzales
Martin County Commissioners' Court	--	Judge	Bryan	Cox
Martin County Commissioners' Court	--	Commissioner	Kenny	Stewart
Martin County Commissioners' Court	--	Commissioner	Robin	Barnes
Martin County Commissioners' Court	--	Commissioner	Bobby	Holland
Martin County Commissioners' Court	--	Commissioner	Koy	Blocker
McCulloch County	--	Ms.	Christine A.	Jones
McCulloch County Commissioners' Court	--	Judge	Frank	Trull
McCulloch County Commissioners' Court	--	Commissioner	Carol	Anderson
McCulloch County Commissioners' Court	--	Commissioner	Randy	Deans
McCulloch County Commissioners' Court	--	Commissioner	Jason	Behrens
McCulloch County Commissioners' Court	--	Commissioner	Rick	Kemp
Mills County	--	Ms.	Sonya	Scott
Mills County Commissioners' Court	--	Judge	Eddilisa	Smith
Mills County Commissioners' Court	--	Commissioner	Mike	Wright
Mills County Commissioners' Court	--	Commissioner	Jed	Garren
Mills County Commissioners' Court	--	Commissioner	Dale	Partin
Mills County Commissioners' Court	--	Commissioner	Jason	Williams
Mitchell County	--	Ms.	Carla	Kern

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Mitchell County Commissioners' Court	--	Judge	Mark	Merrell
Mitchell County Commissioners' Court	--	Commissioner	Dennis	Jones
Mitchell County Commissioners' Court	--	Commissioner	Jeremy	Strain
Mitchell County Commissioners' Court	--	Commissioner	Jesse	Munoz
Mitchell County Commissioners' Court	--	Commissioner	Ricky	Bailey
Nolan County	--	Mr.	Sharla	Keith
Nolan County Commissioners' Court	--	Judge	Whitley	May
Nolan County Commissioners' Court	--	Commissioner	Terry	Willman
Nolan County Commissioners' Court	--	Commissioner	Seth	Mahaffey
Nolan County Commissioners' Court	--	Commissioner	Tommy	White
Nolan County Commissioners' Court	--	Commissioner	Henry	Ortega
Roosevelt County	--	Ms.	Mandi	Park
Roosevelt County Commissioners' Court	--	Judge	Terry	Kendall
Roosevelt County Commissioners' Court	--	Commissioner	Dennis	Lopez
Roosevelt County Commissioners' Court	--	Commissioner	Rodney	Savage
Roosevelt County Commissioners' Court	--	Commissioner	Shane	Lee
Roosevelt County Commissioners' Court	--	Commissioner	Tina	Dixon
Roosevelt County Commissioners' Court	--	Commissioner	Paul	Grider
Runnels County Clerk	--	Ms.	Elesa	Ocker
Runnels County Commissioners' Court	--	Judge	Julia	Miller
Runnels County Commissioners' Court	--	Commissioner	Carl	King
Runnels County Commissioners' Court	--	Commissioner	Ronald	Presley
Runnels County Commissioners' Court	--	Commissioner	Brandon	Poehls

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Runnels County Commissioners' Court	--	Commissioner	Juan	Ornelas
San Saba County	--	Ms.	Kim	Wells
San Saba County Commissioners' Court	--	Judge	Byron	Theodosis
San Saba County Commissioners' Court	--	Commissioner	James	Lebow
San Saba County Commissioners' Court	--	Commissioner	Rickey	Lusty
San Saba County Commissioners' Court	--	Commissioner	Kenley	Kroll
San Saba County Commissioners' Court	--	Commissioner	Pat	Pool
Scurry County	--	Ms.	Melody	Appleton
Scurry County Commissioners' Court	--	Judge	Dan	Hicks
Scurry County Commissioners' Court	--	Commissioner	Terry	Williams
Scurry County Commissioners' Court	--	Commissioner	Trisha	Cockrell
Scurry County Commissioners' Court	--	Commissioner	Shawn	McCowen
Scurry County Commissioners' Court	--	Commissioner	Jim	Robinson
Stonewall County	--	Ms.	Holly D'Ann	McLaury
Stonewall County Commissioners' Court	--	Judge	Ronnie	Moorhead
Stonewall County Commissioners' Court	--	Commissioner	Donna	McCoy
Stonewall County Commissioners' Court	--	Commissioner	Jan	Harris
Stonewall County Commissioners' Court	--	Commissioner	Kirk	Meador
Stonewall County Commissioners' Court	--	Commissioner	Gary	Meyers
Terry County	--	Ms.	Kim	Carter
Terry County Commissioners' Court	--	Judge	J.D.	Wagner
Terry County Commissioners' Court	--	Commissioner	Mike	Swain
Terry County Commissioners' Court	--	Commissioner	Kirby	Keesee

Table A-1. Dyess AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name
Terry County Commissioners' Court	--	Commissioner	Martin	Lefevere
Terry County Commissioners' Court	--	Commissioner	Ernesto	Elizardo
Yoakum County	--	Ms.	Summer	Lovelace
Yoakum County Commissioners' Court	--	Judge	Michael	Ybarra
Yoakum County Commissioners' Court	--	Commissioner	Woodson W.	Lindsey
Yoakum County Commissioners' Court	--	Commissioner	Ray	Marion
Yoakum County Commissioners' Court	--	Commissioner	Tommy	Box
Yoakum County Commissioners' Court	--	Commissioner	Tim	Addison
U.S. Environmental Protection Agency, Region 6	Region 6	Mr.	McQueen	Ken
U.S. Environmental Protection Agency, Region 6	Region 6	Mr.	Arturo J.	Blanco
U.S. Fish and Wildlife Service	Austin Ecological Services Field Office	Mr.	Christina	Williams
U.S. Fish and Wildlife Service	New Mexico Ecological Services Field Office (NMESFO)	Mr.	Sartorius	Shawn
National Park Service, Regions 6, 7, and 8	Regions 6, 7, and 8	Ms.	Kate	Hammond
U.S. Department of Interior Indian Affairs, Southwest Region Regional Office	Southwest Region Regional Office*	--	--	--
U.S. Department of Interior Indian Affairs, Southern Plains Regional Office	Southern Plains Regional Office	Mr.	James	Schock

* Cells for first and last names with an "--" indicate that the specific name of an office holder was not available, but notifications were instead addressed to the organization and office itself.

A.2.1.2 Tribal Mailing List

Table A-2. Dyess AFB Tribal Mailing List

Name of Business, Organization, or Agency	Greeting Line	First Name	Last Name	Address	City	State	Zip Code
Apache Tribe of Oklahoma	Chairman	Bobby	Komardly	P.O. Box 1330	Anadrarko	OK	73005
Caddo Nation of Oklahoma	Chairman	Tammy	Francis-Fourkiller	P.O. Box 487	Binger	OK	73009
Comanche Nation	Chairman	William	Nelson Sr.	P.O. Box 908	Lawton	OK	73502
Comanche Nation	Ms.	Martina	Callahan	P.O. Box 908	Lawton	OK	73502
Fort Sill Apache Tribe of Oklahoma	Chairman	Jeff	Haozous	43187 U.S. Hwy 281	Apache	OK	73006
Jicarilla Apache Nation	Chairman	Donnie	Garcia	P.O. Box 507	Dulce	NM	87528
Kickapoo Traditional Tribe of Texas	Chairman	Juan	Garza	2212 Rosita Valley Road	Eagle Pass	TX	78852
Kiowa Tribe of Oklahoma	Chairman	Matthew	Komalty	P.O. Box 369	Carnegie	OK	73015
Mescalero Apache Tribe	President	Gabe	Aguilar	P.O. Box 227	Mescalero	NM	88340
Tonkawa Tribe of Indians of Oklahoma	President	Russell	Martin	1 Rush Buffalo Rd.	Tonkawa	OK	74653
Wichita and Affiliated Tribes	President	Terri	Parton	P.O. Box 729	Anadarko	OK	73005
Ysleta Del Sur Pueblo	Governor	E. Michael	Silvas	P.O. Box 17579	El Paso	TX	79907

1 ## A.2.2 Whiteman AFB Mailing Lists

2 ### A.2.2.1 Agency and Interested Parties Mailing List

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
U.S. House of Representatives	Kansas, District 1	Congressman	Tracey	Mann
U.S. House of Representatives	Kansas, District 2	Congressman	Jake	LaTurner
U.S. House of Representatives	Kansas, District 3	Congresswoman	Sharice	Davids
U.S. Senate	Kansas	Senator	Jerry	Moran
U.S. Senate	Kansas	Senator	Roger	Marshall
U.S. Senate	Missouri	Senator	Roy	Blunt
U.S. Senate	Missouri	Senator	Josh	Hawley
U.S. House of Representatives	Missouri, District 3	Congressman	Blaine	Luetkemeyer
U.S. House of Representatives	Missouri, District 4	Congresswoman	Vicky	Hartzler
U.S. House of Representatives	Missouri, District 5	Congressman	Emanuel	Cleaver
U.S. House of Representatives	Missouri, District 6	Congressman	Sam	Graves
U.S. House of Representatives	Missouri, District 7	Congressman	Billy	Long
U.S. House of Representatives	Missouri, District 8	Congressman	Jason	Smith
Kansas House of Representatives	District 106	Congresswoman	Lisa	Moser
Kansas House of Representatives	District 107	Congresswoman	Susan	Concannon
Kansas House of Representatives	District 108	Congressman	Steven	Johnson
Kansas House of Representatives	District 109	Congressman	Troy	Waymaster
Kansas House of Representatives	District 112	Congresswoman	Tory Marie	Arnberger
Kansas House of Representatives	District 13	Congressman	Joe	Newland
Kansas House of Representatives	District 64	Congresswoman	Suzi	Carlson
Kansas House of Representatives	District 70	Congressman	John	Barker
Kansas House of Representatives	District 73	Congressman	Les	Mason
Kansas Senate	District 15	Senator	Virgil	Peck, Jr.
Kansas Senate	District 22	Senator	Tom	Hawk
Kansas Senate	District 24	Senator	J.R.	Claeys
Kansas Senate	District 33	Senator	Alicia	Straub
Kansas Senate	District 35	Senator	Rick	Wilborn

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Kansas Senate	District 36	Senator	Elaine	Bowers
State of Kansas	Office of the Governor	Governor	Laura	Kelly
State of Missouri	Office of the Governor	Governor	Michael L.	Parson
Missouri Senate	District 3	Senator	Elaine	Gannon
Missouri Senate	District 6	Senator	Mike	Bernskoetter
Missouri Senate	District 7	Senator	Greg	Razer
Missouri Senate	District 8	Senator	Mike	Cierpiot
Missouri Senate	District 9	Senator	Barbara	Washington
Missouri Senate	District 10	Senator	Jeanie	Riddle
Missouri Senate	District 11	Senator	John	Rizzo
Missouri Senate	District 16	Senator	Justin	Brown
Missouri Senate	District 19	Senator	Caleb	Rowden
Missouri Senate	District 20	Senator	Eric	Burlison
Missouri Senate	District 21	Senator	Denny	Hoskins
Missouri Senate	District 22	Senator	Paul	Weiland
Missouri Senate	District 25	Senator	Jason	Bean
Missouri Senate	District 26	Senator	Dave	Schatz
Missouri Senate	District 28	Senator	Sandy	Crawford
Missouri Senate	District 29	Senator	Mike	Moon
Missouri Senate	District 30	Senator	Lincoln	Hough
Missouri Senate	District 31	Senator	Rick	Brattin
Missouri Senate	District 32	Senator	Bill	White
Missouri Senate	District 33	Senator	Karla	Eslinger
Missouri House of Representatives	District 7	Congresswoman	Peggy	McGaugh
Missouri House of Representatives	District 19	Congresswoman	Ingrid	Burnett
Missouri House of Representatives	District 20	Congressman	Aaron	McMullen
Missouri House of Representatives	District 21	Congressman	Robert	Sauls
Missouri House of Representatives	District 22	Congresswoman	Yolanda	Young
Missouri House of Representatives	District 23	Congressman	Michael	Johnson
Missouri House of Representatives	District 24	Congresswoman	Emily	Weber

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Missouri House of Representatives	District 25	Congresswoman	Patty	Lewis
Missouri House of Representatives	District 26	Congressman	Ashley Bland	Manlove
Missouri House of Representatives	District 27	Congressman	Richard	Brown
Missouri House of Representatives	District 28	Congressman	Jerome	Barnes
Missouri House of Representatives	District 29	Congressman	Aaron	Crossley
Missouri House of Representatives	District 30	Congressman	Jonathan	Patterson
Missouri House of Representatives	District 31	Congressman	Dan	Stacy
Missouri House of Representatives	District 32	Congressman	Jeff	Coleman
Missouri House of Representatives	District 33	Congressman	Chris	Sander
Missouri House of Representatives	District 34	Congressman	Kemp	Strickler
Missouri House of Representatives	District 35	Congresswoman	Keri	Ingle
Missouri House of Representatives	District 36	Congressman	Anthony	Ealy
Missouri House of Representatives	District 37	Congressman	Mark	Sharp
Missouri House of Representatives	District 42	Congressman	Jeff	Myers
Missouri House of Representatives	District 43	Congressman	Kent	Haden
Missouri House of Representatives	District 44	Congresswoman	Cheri Toalson	Reisch
Missouri House of Representatives	District 45	Congresswoman	Kathy	Steinhoff
Missouri House of Representatives	District 46	Congressman	David Tyson	Smith
Missouri House of Representatives	District 47	Congressman	Adrian	Plank
Missouri House of Representatives	District 48	Congressman	Tim	Taylor
Missouri House of Representatives	District 49	Congressman	Jim	Schulte
Missouri House of Representatives	District 50	Congressman	Doug	Mann

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Missouri House of Representatives	District 51	Congressman	Kurtis	Gregory
Missouri House of Representatives	District 52	Congressman	Brad	Pollitt
Missouri House of Representatives	District 53	Congressman	Terry	Thompson
Missouri House of Representatives	District 54	Congressman	Dan	Houx
Missouri House of Representatives	District 55	Congressman	Mike	Haffner
Missouri House of Representatives	District 56	Congressman	Michael	Davis
Missouri House of Representatives	District 57	Congressman	Rodger	Reedy
Missouri House of Representatives	District 58	Congressman	Willard	Haley
Missouri House of Representatives	District 59	Congressman	Rudy	Veit
Missouri House of Representatives	District 60	Congressman	Dave	Griffith
Missouri House of Representatives	District 61	Congressman	Bruce	Sassmann
Missouri House of Representatives	District 62	Congresswoman	Sherri	Gallick
Missouri House of Representatives	District 109	Congressman	Kyle	Marquart
Missouri House of Representatives	District 118	Congressman	Mike	McGirl
Missouri House of Representatives	District 119	Congressman	Brad	Banderman
Missouri House of Representatives	District 120	Congressman	Ron	Copeland
Missouri House of Representatives	District 121	Congressman	Bill	Hardwick
Missouri House of Representatives	District 122	Congresswoman	Tara	Peters
Missouri House of Representatives	District 123	Congresswoman	Lisa	Thomas
Missouri House of Representatives	District 124	Congressman	Don	Mayhew
Missouri House of Representatives	District 125	Congressman	Dane	Diehl
Missouri House of Representatives	District 126	Congressman	Jim	Kalberloh
Missouri House of Representatives	District 127	Congresswoman	Ann	Kelley

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Missouri House of Representatives	District 128	Congressman	Mike	Stephens
Missouri House of Representatives	District 129	Congressman	John	Black
Missouri House of Representatives	District 130	Congressman	Bishop	Davidson
Missouri House of Representatives	District 131	Congressman	Bill	Owen
Missouri House of Representatives	District 132	Congresswoman	Crystal	Quade
Missouri House of Representatives	District 133	Congresswoman	Melanie	Stinnett
Missouri House of Representatives	District 135	Congresswoman	Betsy	Fogle
Missouri House of Representatives	District 136	Congresswoman	Stephanie	Hein
Missouri House of Representatives	District 137	Congressman	Darin	Chappell
Missouri House of Representatives	District 138	Congressman	Brad	Hudson
Missouri House of Representatives	District 139	Congressman	Bob	Titus
Missouri House of Representatives	District 140	Congressman	Jamie Ray	Gragg
Missouri House of Representatives	District 141	Congresswoman	Hannah	Kelly
Missouri House of Representatives	District 142	Congressman	Jeff	Knight
Missouri House of Representatives	District 143	Congressman	Bennie	Cook
Missouri House of Representatives	District 144	Congresswoman	Chris	Dinkins
Missouri House of Representatives	District 153	Congressman	Darrell	Atchison
Missouri House of Representatives	District 154	Congressman	David	Evans
Missouri House of Representatives	District 155	Congressman	Travis	Smith
Missouri House of Representatives	District 156	Congressman	Brian	Seitz
Missouri House of Representatives	District 157	Congressman	Mitch	Boggs
Missouri House of Representatives	District 158	Congressman	Scott	Cupps
Missouri House of Representatives	District 159	Congressman	Dirk	Deaton

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Missouri House of Representatives	District 160	Congressman	Ben	Baker
Missouri House of Representatives	District 161	Congressman	Lane	Roberts
Missouri House of Representatives	District 162	Congressman	Bob	Bromley
Missouri House of Representatives	District 163	Congressman	Cody	Smith
Audrain County	--	Ms.	Lisa	Smith
Audrain County	--	Judge	Jason	Lamb
Audrain County	--	Commissioner	Alan	Winders
Audrain County	--	Commissioner	Tracy	Graham
Audrain County	--	Commissioner	Leslie	Meyer
Barry County	--	Judge	David	Cole
Barry County	--	Ms.	Joyce	Ennis
Barry County	--	Commissioner	Cherry	Warren
Barry County	--	Commissioner	Wayne	Hendrix
Barry County	--	Commissioner	Frank	Washburn
County Commissioners' Court	--	Ms.	Kristina	Crockett
County Commissioners' Court	--	Judge	David	Munton
Barton County	--	Commissioner	Mike	Davis
Barton County	--	Commissioner	Ben	Reed
Barton County	--	Commissioner	Jeff	Tucker
Bates County	--	Ms.	Marlene	Wainscott
Bates County	--	Judge	M Brandon	Baker
Bates County	--	Commissioner	Jim	Wheatley
Bates County	--	Commissioner	Ken	Mooney
Bates County	--	Commissioner	Trent	Nelson
Benton County	--	Ms.	Susan	Porterfield
Benton County	--	Judge	M Brandon	Baker
Benton County	--	Commissioner	Steve	Daleske
Benton County	--	Commissioner	Scott	Harms
Benton County	--	Commissioner	Larry	Berry
Boone County	--	Ms.	Brianna L	Lennon
Boone County	--	Judge	Hasbrouck	Jacobs

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Boone County	--	Commissioner	Daniel K	Atwill
Boone County	--	Commissioner	Justin	Aldred
Boone County	--	Commissioner	Janet	Thompson
Bourbon County	--	Ms.	Ashley	Shelton
Bourbon County	--	Judge	Mark A	Ward
Bourbon County	--	Commissioner	Lynne	Oharah
Bourbon County	--	Commissioner	Jim	Harris
Bourbon County	--	Commissioner	Clifton	Beth
Callaway County	--	Ms.	Rhonda	Miller
Callaway County	--	Judge	Hasbrouck	Jacobs
Callaway County	--	Commissioner	Gary	Jungermann
Callaway County	--	Commissioner	Roger	Fischer
Callaway County	--	Commissioner	Randall L	Kleindienst
Camden County	--	Mr.	Todd	Rowland
Camden County	--	Commissioner	James	Gohagan
Camden County	--	Commissioner	Don	Williams
Carroll County	--	Judge	Matt	Hamner
Carroll County	--	Ms.	Norma	Sparks
Carroll County	--	Judge	Kevin	Walden
Carroll County	--	Commissioner	Stan	Falke
Carroll County	--	Commissioner	Everette	Sheilds
Carroll County	--	Commissioner	David	Martin
Carter County	--	Ms.	Leona	Stephens
Carter County	--	Judge	Donald	Black
Carter County	--	Commissioner	Lynn	Murdick
Carter County	--	Commissioner	Andy	Steiger
Carter County	--	Judge	Steven	Privette
Cass County	--	Mr.	Jeff	Fletcher
Cass County	--	Judge	William	Collins
Cass County	--	Commissioner	Bob	Huston
Cass County	--	Commissioner	Monty	Kisner
Cass County	--	Commissioner	Ryan	Johnson
Cedar County	--	Ms.	Heather	York
Cedar County	--	Judge	David	Munton

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Cedar County	--	Commissioner	Marlon	Collins
Cedar County	--	Commissioner	Don	Boultinghouse
Cedar County	--	Commissioner	Ted	Anderson
Cherokee County	--	Ms.	Rebecca S	Brassart
Cherokee County	--	Judge	Maradeth	Frederick
Cherokee County	--	Commissioner	Myra	Carlisle-Frazier
Cherokee County	--	Commissioner	Lorie	Johnson
Cherokee County	--	Commissioner	Cory	Moates
Christian County	--	Ms.	Kay	Brown
Christian County	--	Judge	Laura	Johnson
Christian County	--	Commissioner	Ralph	Phillips
Christian County	--	Commissioner	Hosea	Bilyeu
Christian County	--	Commissioner	Jamie	Gragg
Clay County	--	Ms.	Kayla	Wang
Clay County	--	Judge	William	Malcolm
Clay County	--	Commissioner	Jerry	Mayo
Clay County	--	Commissioner	Eric	Carlson
Clay County	--	Commissioner	David	Thurlow
Cloud County	--	Ms.	Shella	Thoman
Cloud County	--	Judge	Guy	Steier
Cloud County	--	Commissioner	Bill	Czapanskiy
Cloud County	--	Commissioner	Gary	Caspers
Cloud County	--	Commissioner	Ron	Copple
Cole County	--	Mr.	Steve	Korsmeyer
Cole County	--	Judge	Jon	Beetem
Cole County	--	Commissioner	Sam	Bushman
Cole County	--	Commissioner	Jeff	Hoelscher
Cole County	--	Commissioner	Harry	Otto
Cooper County	--	Ms.	Sarah	Herman
Cooper County	--	Judge	Robert	Koffman
Cooper County	--	Commissioner	Don	Baragary
Cooper County	--	Commissioner	Charlie	Melkersman
Cooper County	--	Commissioner	Danny	Larm

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Crawford County	--	Ms.	Lisa	Lusker
Crawford County	--	Judge	Jennifer	Brunetti
Crawford County	--	Commissioner	Bruce	Blair
Crawford County	--	Commissioner	Tom	Moody
Crawford County	--	Commissioner	Jeremy	Johnson
Crawford County	--	Mr.	John. G.	Martin
Crawford County	--	Judge	Michael	Randazzo
Crawford County	--	Commissioner	Leo	Sanders
Crawford County	--	Commissioner	Rob	Cummings
Crawford County	--	Commissioner	Jared	Boast
Dade County	--	Ms.	Melinda	Wright
Dade County	28th Judicial Circuit	Judge	David	Munton
Dade County	--	Commissioner	Randall	Daniel
Dade County	--	Commissioner	Jake	O'Connor
Dade County	--	Commissioner	Brian	White
Dallas County	--	Ms.	Pam	Louderbaugh
Dallas County	--	Judge	Michael	Hendrickson
Dent County	--	Ms.	Angie	Curley
Dent County	--	Judge	Michael	Randazzo
Dent County	--	Commissioner	Darrell	Skiles
Dent County	--	Commissioner	Wes	Mobray
Dent County	--	Commissioner	Gary	Larson
Dickinson County	--	Ms.	Jeanne	Livingston
Dickinson County	--	Judge	Benjamin	Sexton
Dickinson County	--	Commissioner	Craig	Chamberlin
Dickinson County	--	Commissioner	Lynn	Peterson
Dickinson County	--	Commissioner	Ron	Roller
Douglas County	--	Ms.	Kim	Hathcock
Douglas County	--	Judge	Craig R	Carter
Douglas County	--	Commissioner	Larry	Pueppke
Douglas County	--	Commissioner	Richard	Mitchell
Douglas County	--	Commissioner	Danny	Dry
Ellsworth County	--	Ms.	Shelly	Vopat
Ellsworth County	--	Judge	Lisa	Beran

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Ellsworth County	--	Judge	Carey	Hipp
Ellsworth County	--	Commissioner	Dennis	Rolfs
Ellsworth County	--	Commissioner	Gregory	Bender
Ellsworth County	--	Commissioner	Stephen	Dlabal
Franklin County	--	Mr.	Tim	Baker
Franklin County	--	Judge	Craig	Hellmann
Franklin County	--	Commissioner	Tim	Brinker
Franklin County	--	Commissioner	Todd	Boland
Franklin County	--	Commissioner	Dave	Hinson
Gasconade County	--	Ms.	Lesa	Lietzow
Gasconade County	--	Judge	Craig	Hellmann
Gasconade County	--	Commissioner	Larry	Miskel
Gasconade County	--	Commissioner	Jim	Holland
Gasconade County	--	Commissioner	Jerry D	Lairmore
Greene County	--	Mr.	Shane	Schoeller
Greene County	--	Judge	Michael	Cordonnier
Greene County	--	Commissioner	Bob	Dixon
Greene County	--	Commissioner	Rusty	MacLachlan
Greene County	--	Commissioner	John C	Russell
Henry County	--	Mr.	Rick	Watson
Henry County	--	Judge	M Brandon	Baker
Henry County	--	Commissioner	Jim	Stone
Henry County	--	Commissioner	Dale	Lawler
Henry County	--	Commissioner	Rick	Fosnow
Hickory County	--	Ms.	Tamara	Weidman
Hickory County	--	Judge	Michael	Hendrickson
Hickory County	--	Commissioner	Keith	Mertz
Hickory County	--	Commissioner	Robert	Breshears
Hickory County	--	Commissioner	Rick	Pearson
Howard County	--	Ms.	Shelly	Howell
Howard County	--	Judge	Scott	Hayes
Howard County	--	Commissioner	Jeremiah	Johnmeyer
Howard County	--	Commissioner	Richard	Conrow

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Howard County	--	Commissioner	Howard	McMillan
Howell County	--	Ms.	Kelly	Waggoner
Howell County	--	Judge	Steven	Privette
Howell County	--	Commissioner	Mark	Collins
Howell County	--	Commissioner	Bill	Lovelace
Howell County	--	Commissioner	Billy	Sexton
Iron County	--	Ms.	Marsha	Womble
Iron County	--	Judge	Michael	Randazzo
Iron County	--	Commissioner	Jim	Scaggs
Jackson County	--	Ms.	Mary Jo	Spino
Jackson County	--	Judge	J Dale	Youngs
Jackson County	--	Mr.	Frank Jr	White
Jasper County	--	Mr.	Charlie	Davis
Jasper County	--	Judge	Gayle	Crane
Jasper County	--	Commissioner	John	Bartosh
Jasper County	--	Commissioner	Tom	Flanigan
Jasper County	--	Commissioner	Darieus	Adams
Jefferson County	--	Judge	Brenda	Stacey
Jefferson County	--	Mr.	Ken	Waller
Jefferson County	--	Mr.	Dennis	Gannon
Johnson County	--	Ms.	Amy	Meeker-Berg
Johnson County	--	Judge	Keven M.P.	O'Grady
Johnson County	--	Commissioner	Ed	Eilert
Johnson County	--	Commissioner	Becky	Fast
Johnson County	--	Commissioner	Jeff	Meyers
Johnson County	--	Commissioner	Charlotte	O'Hara
Johnson County	--	Commissioner	Janee'	Hanzlick
Johnson County	--	Commissioner	Michael L	Ashcraft
Johnson County	--	Commissioner	Shirley	Allenbrand
Johnson County	--	Ms.	Diane	Thompson
Johnson County	--	Judge	William B	Collins
Johnson County	--	Commissioner	Densil	Allen
Johnson County	--	Commissioner	Charles	Kavanaugh

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Johnson County	--	Commissioner	John	Marr
Laclede County	--	Ms.	Linda	Cansler
Laclede County	--	Judge	Matt	Hamner
Laclede County	--	Commissioner	Randy	Angst
Laclede County	--	Commissioner	David	Layman
Laclede County	--	Commissioner	Darrell	Pollock
Lafayette County	--	Ms.	Jennifer	Middleton
Lafayette County	15th Judicial Circuit	Judge	Dennis	Rolf
Lafayette County	--	Commissioner	Harold	Hoflander
Lafayette County	--	Commissioner	Dane	Plymell
Lafayette County	--	Commissioner	Brad	MacLaughlin
Lawrence County	--	Ms.	Tammy	Riebe
Lawrence County	--	Judge	David	Cole
Lawrence County	--	Commissioner	Bob	Senninger
Lawrence County	--	Commissioner	Tim	Selvey
Lawrence County	--	Commissioner	David	Botts
Lincoln County	--	Ms.	Dawn	Harlow
Lincoln County	--	Judge	Jennifer	O'Hare
Lincoln County	--	Commissioner	Randy	Lohmann
Lincoln County	--	Commissioner	Dennis	Ray
Lincoln County	--	Commissioner	Darrell	Oetting
Maries County	--	Ms.	Rhonda	Brewer
Maries County	--	Judge	John	Begar
Maries County	--	Commissioner	Victor	Stratman
Maries County	--	Commissioner	Ed	Fagre
Maries County	--	Commissioner	Douglas	Drewel
McDonald County	--	Ms.	Kimberly	Bell
McDonald County	--	Judge	Gregory	Stremel
McDonald County	--	Commissioner	Bill	Lant
McDonald County	--	Commissioner	Jamey	Cope
McDonald County	--	Commissioner	Rick	Lett
McPherson County	--	Ms.	Hollie	Melroy
McPherson County	--	Judge	Ellen	Neufeld
McPherson County	--	Commissioner	Keith	Becker

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
McPherson County	--	Commissioner	Tom	Kueser
McPherson County	--	Commissioner	David	O'Dell
Miller County	--	Mr.	Clinton	Jenkins
Miller County	--	Judge	Matt	Hamner
Miller County	--	Commissioner	Tom	Wright
Miller County	--	Commissioner	Don	Abbett
Miller County	--	Commissioner	Travis	Lawson
Mitchell County	--	Mr.	Chris	Treaster
Mitchell County	--	Judge	Debra	Wright
Mitchell County	--	Commissioner	Tom	Claussen
Mitchell County	--	Commissioner	Mike	Cooper
Mitchell County	--	Commissioner	Jim	Marshall
Moniteau County	--	Ms.	Roberta	Elliott
Moniteau County	--	Judge	Matt	Hamner
Moniteau County	--	Commissioner	Kenneth	Kunze
Moniteau County	--	Commissioner	Clint	Hoellering
Moniteau County	--	Commissioner	Rick	Messerli
Montgomery County	--	Ms.	Kathy	Hancock
Montgomery County	--	Judge	Jason	Lamb
Montgomery County	--	Commissioner	Ryan D	Poston
Montgomery County	--	Commissioner	Dave	Teeter
Montgomery County	--	Commissioner	Doug	Lensing
Morgan County	--	Ms.	Aimee	Worthley
Morgan County	--	Judge	Matt	Hamner
Morgan County	--	Commissioner	Tony	Stephens
Morgan County	--	Commissioner	Brian	Lehman
Morgan County	--	Commissioner	Ryan	Hoffa
Newton County	--	Ms.	Tami	Owens
Newton County	--	Judge	Gregory	Stremel
Newton County	--	Commissioner	Bill	Reiboldt
Newton County	--	Commissioner	Alan	Cook
Newton County	--	Commissioner	David	Osborn
Oregon County	--	Ms.	Tracy	Bridges
Oregon County	--	Judge	Steven	Privette

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Oregon County	--	Commissioner	David	Stubblefield
Osage County	--	Ms.	Nicci	Kammerich
Osage County	--	Judge	Craig	Hellmann
Osage County	--	Commissioner	Darryl	Griffin
Osage County	--	Commissioner	John	Trenshaw
Osage County	--	Commissioner	Larry	Kliethermes
Osborne County	--	Ms.	Heather	Betzold
Osborne County	--	Judge	Renee	Henke
Osborne County	--	Commissioner	Craig	Pottberg
Osborne County	--	Commissioner	Alfred C	Reif
Osborne County	--	Commissioner	C.W.	Seaman
Ottawa County	--	Ms.	Heather	Maddox
Ottawa County	--	Judge	Jason C.	Parks
Ottawa County	--	Commissioner	Dawn	Wolf
Ottawa County	--	Commissioner	Scott	Mortimer
Ottawa County	--	Commissioner	D.D.	Malmberg
Ottawa County	--	Ms.	Robyn	Mitchell
Ottawa County	--	Judge	Barry V.	Denney
Ottawa County	--	Commissioner	Mike	Furnas
Ottawa County	--	Commissioner	Larry	Mcelhany
Ottawa County	--	Commissioner	Russell	Earls
Pettis County	--	Mr.	Nick	La Strada
Pettis County	--	Judge	Robert	Koffman
Pettis County	--	Commissioner	David	Dick
Pettis County	--	Commissioner	Isreal	Baeza
Pettis County	--	Commissioner	Jim	Marcum
Phelps County	--	Ms.	Pamela	Grow
Phelps County	--	Judge	John D	Beger
Phelps County	--	Commissioner	Randy	Verkamp
Phelps County	--	Commissioner	Joey	Auxier
Phelps County	--	Commissioner	Gary	Hicks
Polk County	--	Ms.	Rachel	Lightfoot
Polk County	--	Judge	Michael	Hendrickson
Polk County	--	Commissioner	Shannon	Hancock

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Polk County	--	Commissioner	Melinda	Robertson
Polk County	--	Commissioner	Kyle	Legan
Pulaski County	--	Mr.	David	Ernst
Pulaski County	--	Judge	John D	Beger
Pulaski County	--	Commissioner	Gene	Newkirk
Pulaski County	--	Commissioner	Charles	Bassett
Pulaski County	--	Commissioner	Clinton	Jarrett
Ray County	--	Ms.	Glenda	Powell
Ray County	--	Judge	Kevin	Walden
Ray County	--	Commissioner	Bob	King
Ray County	--	Commissioner	Dave	Powell
Ray County	--	Commissioner	Gary	Wilhite
Republic County	--	Ms.	Kathleen	Marsicek
Republic County	--	Judge	Regine	Thompson
Republic County	--	Commissioner	Edwin	Splichal
Republic County	--	Commissioner	Doug	Garman
Republic County	--	Commissioner	Melivin	Jeardoe
Reynolds County	--	Mr.	Mike	Harper
Reynolds County	--	Judge	Michael	Randazzo
Reynolds County	--	Commissioner	Joe	Loyd
Ripley County	--	Ms.	Becky	York
Ripley County	36th Judicial Circuit	Judge	Michael	Pritchett
Ripley County	--	Commissioner	Jesse	Roy
Russell County	--	Ms.	Mary	Nuss
Russell County	--	Judge	Andrea	Cross
Russell County	--	Commissioner	Steve	Reinhardt
Russell County	--	Commissioner	Daron	Woelk
Russell County	--	Commissioner	Jogn W	Strobel
Saline County	--	Ms.	Jamie R.	Doss
Saline County	--	Judge	Rene	Young
Saline County	--	Commissioner	Monte	Shadwick
Saline County	--	Commissioner	Robert II	Vidricksen
Saline County	--	Commissioner	Rodger	Sparks
Saline County	--	Commissioner	James L	Weese

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Saline County	--	Commissioner	Michael J	White
Saline County	--	Ms.	Debbie	Russell
Saline County	--	Judge	Dennis	Rolf
Saline County	--	Commissioner	Kile Jr	Guthrey
Saline County	--	Commissioner	Monte	Fenner
Saline County	--	Commissioner	Stephanie	Gooden
Shannon County	--	Ms.	Shelly	Bland
Shannon County	--	Judge	Steven	Privette
Shannon County	--	Commissioner	Jeff	Cowen
Shannon County	--	Commissioner	Herman	Kelly
Shannon County	--	Commissioner	Dale	Counts
St. Clair County	--	Ms.	Debbie	Peden
St. Clair County	--	Judge	Brandon	Baker
St. Clair County	--	Commissioner	Robert	Salmon
St. Clair County	--	Commissioner	Leroy	Strope
St. Clair County	--	Commissioner	Randy	Smith
Stone County	--	Ms.	Denise	Dickens
Stone County	--	Judge	David	Cole
Stone County	--	Commissioner	Mark	Maples
Stone County	--	Commissioner	Wayne	Blades
Stone County	--	Commissioner	Hank	Smythe
Taney County	--	Ms.	Donna	Neeley
Taney County	--	Judge	Jeffrey	Merrell
Taney County	--	Commissioner	Mike	Scofield
Taney County	--	Commissioner	Brandon	Williams
Taney County	--	Commissioner	Sheila	Wyatt
Texas County	--	Ms.	Peggy	Seyler
Texas County	--	Judge	John	Beger
Texas County	--	Commissioner	Scott	Long
Texas County	--	Commissioner	John	Casey
Texas County	--	Commissioner	Doyle	Heiney
Vernon County	--	Mr.	Mike	Buehler
Vernon County	--	Judge	David R	Munton
Vernon County	--	Commissioner	Joe	Hardin

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Vernon County	--	Commissioner	Everette L	Wolfe
Vernon County	--	Commissioner	Cindy	Thompson
Washington County	--	Ms.	Diana	Svanda
Washington County	--	Judge	Kim	Cudney
Washington County	--	Commissioner	Scott	Zaborkrtsky
Washington County	--	Commissioner	David	Willbrandt
Washington County	--	Commissioner	Raleigh	Ordoyne
Washington County	--	Ms.	Jeanette	Allen
Washington County	--	Judge	Wendy	Wexler Horn
Washington County	--	Commissioner	Dave	Sansegraw
Washington County	--	Commissioner	Doug	Short
Washington County	--	Commissioner	Cody	Brinley
Webster County	--	Mr.	Stanley	Whitehurst
Webster County	--	Judge	Michael	Hendrickson
Webster County	--	Commissioner	Paul	Ipock
Webster County	--	Commissioner	Dale	Fraker
Webster County	--	Commissioner	Randy	Owens
Wright County	--	Ms.	Nelda	Masner
Wright County	--	Judge	R. Craig	Carter
Wright County	--	Commissioner	Zach	Williams
Wright County	--	Commissioner	Randy	Pamperien
Wright County	--	Commissioner	Tommy	Kingery
Barton County	--	Commissioner	Kirby	Krier
Barton County	--	Commissioner	Barb	Esfeld
Barton County	--	Commissioner	Shawn	Hutchinson
Barton County	--	Commissioner	Jon	Prescott
Barton County	--	Commissioner	Jennifer	Schartz
Rush County	--	Ms.	Tacy	Keener
Rush County	--	Commissioner	Richard	Luft
Rush County	--	Commissioner	Mitchell	Blackburn
Rush County	--	Commissioner	Les	Rogers
Rice County	--	Ms.	Aurelia	Garcia
Rice County	--	Commissioner	Derek	McCloud
Rice County	--	Commissioner	Clay	Thomas

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
Rice County	--	Commissioner	Terry	David
20th Judicial District Court	--	Judge	Carey	Hipp
20th Judicial District Court	--	Judge	Steven	Johnson
20th Judicial District Court	--	Judge	Lisa	Beran
20th Judicial District Court	--	Judge	Richard	Burgess, Jr.
20th Judicial District Court	--	Judge	Andrea	Cross
20th Judicial District Court	--	Judge	Peggy	Svaty
City of Knob Noster	Ward 3 Alderman	Alderman	Benjamin	Liechti
City of Knob Noster	Ward 3 Alderman	Alderman	Tom	Brent
City of Knob Noster	Ward 2 Alderman	Alderman	Jesse	Stauffer-Baum
City of Knob Noster	Ward 2 Alderman	Alderman	Bud	Thering
City of Knob Noster	Ward 1 Alderman	Alderman	Zach	Grove
City of Knob Noster	Ward 1 Alderman	Alderman	Perry	Byerly
City of Knob Noster	--	Mayor	Tom	Charrette
Knob Noster School Board	--	Ms.	Kelly	Davis
Knob Noster School Board	--	Mr.	Paul	Hills
City of Warrensburg	--	Mayor	Jim	Kushner
City of Warrensburg	--	Mr.	Tarl	Bentley
City of Warrensburg	--	Council Member	Casey	Lund
City of Warrensburg	--	Council Member	Bruce	Uhler
City of Warrensburg	--	Council Member	Eddie	Osborne
City of Sedalia	--	Mayor	Andrew	Dawson
City of Sedalia	Sedalia City Council, Ward 1	Council Member	Tom	Oldham
City of Sedalia	Sedalia City Council, Ward 1	Council Member	Jack	Robinson
City of Sedalia	Sedalia City Council, Ward 2	Council Member	Chris	Marshall
City of Sedalia	Sedalia City Council, Ward 2	Council Member	Tina	Boggess
City of Sedalia	Sedalia City Council, Ward 3	Council Member	Bob	Cross
City of Sedalia	Sedalia City Council, Ward 3	Council Member	Bob	Hiller
City of Sedalia	Sedalia City Council, Ward 4	Council Member	Rhiannon	Foster

Table A-3. Whiteman AFB Agency and Interested Parties Mailing List

Name of Business, Organization, or Agency	Legislative District/Region or Department	Greeting Line	First Name	Last Name with Suffix
City of Sedalia	Sedalia City Council, Ward 1	Council Member	Steve	Bloeness
National Park Service	Regions 3, 4, and 5	Mr.	Bert	Frost
U.S. Department of Agriculture, Forest Service	Region 9: Eastern Region	Ms.	Gina	Owens
U.S. Department of Agriculture, Forest Service, Region 8	Region 8: Southern Region	Mr.	Ken	Arney
U.S. Environmental Protection Agency	Region 6 - (Arkansas, Louisiana, New Mexico, Oklahoma, Texas)	Mr.	Matthew	Reynolds
U.S. Fish and Wildlife	Kansas Ecological Services Field Office	Mr.	Jason	Luginbill
U.S. Department of Interior Indian Affairs, Eastern Regional Office	Eastern Regional Office*	Regional Director	--	--
Kansas Department of Wildlife, Parks, and Tourism*	--	Sir or Madam Secretary	--	--
Kansas State Historic Preservation Office	--	Ms.	Katrina	Ringler
Missouri State Historic Preservation Office	--	Dr.	Toni	Prawl
Oklahoma State Historic Preservation Office	Oklahoma Historical Society, Oklahoma History Center	Mr.	Trait	Thompson
City of Knob Noster	--	Mr.	Scott	Peterson
City of Knob Noster	--	Ms.	Amy	Schouten
Knob Noster Area Business Council	--	President	Mary	Austin
Knob Noster Fire Department	--	Mr.	Rick	Johnson
Johnson County Military Airport Zoning Commission	Military Airport Zoning Board	Commissioner	Chuck	Barlow
City of Warrensburg	--	Ms.	Danielle	Dulin
Warrensburg Chamber of Commerce	Board of Directors	Ms.	Jamie	Brisbin
Sedaila Area Chamber of Commerce	Executive Board of Directors	President	Katie	Shannon
Pioneer Trails Regional Planning Commission	--	Mr.	Norm	Lucus

* Cells for first and last names with an "--" indicate that the specific name of an office holder was not available, but notifications were instead addressed to the organization and office itself.

A.2.2.2 Tribal Mailing List

Table A-4. Whiteman AFB Tribal Mailing List

Name of Business, Organization, or Agency	Greeting Line	First Name	Last Name	Address	City	State	Zip Code
Osage Nation Historic Preservation Office	Dr.	Andrea	Hunter, Ph.D.	627 Grandview	Pawhuska	OK	74056
Quapaw Nation Historic Preservation Program	Mr.	Everett	Bandy	P.O. Box 765	Quapaw	OK	74363

Key: OK = Oklahoma

A.3 SCOPING LETTER

A.3.1 Dyess AFB Scoping Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

13 Mar 23

MEMORANDUM FOR Federal, State, and Local Public Agencies
Interested Parties
Members of the Public

FROM: 7 BW/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

SUBJECT: Proposed B-21 Bomber Beddown Main Operating Base (MOB) 2 or MOB 3 at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri

1. Notice of Public Meetings

a. The Department of the Air Force (DAF) is issuing this notice to inform state and local agencies of its intent to prepare an Environmental Impact Statement (EIS) for the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri. The DAF's notice of intent to prepare an EIS and hold public scoping meetings was published in the *Federal Register* (FR) on March 24, 2023. The EIS will assess the potential environmental consequences of the proposal to beddown the Department of Defense's new bomber aircraft, the B-21 "Raider," which will eventually replace existing B-1 and B-2 bomber aircraft. The EIS is being prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500–1508 (85 FR 43359, July 16, 2020, as amended by 87 FR 23453, April 20, 2022), the Council on Environmental Quality regulations for implementing NEPA; and the DAF Environmental Impact Analysis Process (32 CFR Part 989).

b. This notice also serves to invite early public and agency participation in determining the scope of environmental issues and alternatives to be analyzed in the EIS and to identify and eliminate from detailed study the issues that are not significant. To effectively define the full range of issues and concerns to be evaluated in the EIS, the DAF is soliciting scoping comments from interested local, state, and federal agencies, interested American Indian tribes, and interested members of the public.

c. The beddown of the B-21 will take place through a series of three MOBs, referred to as MOB 1, MOB 2, and MOB 3. The DAF previously selected Ellsworth AFB as the MOB 1 location and is now preparing an EIS to evaluate the potential beddown impacts of MOB 2 or MOB 3 at Dyess AFB, Texas or Whiteman AFB, Missouri. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course (WIC), and Operational Test and Evaluation (OT&E) Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, WIC, OT&E, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman

DEATH FROM ABOVE

AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

d. It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

e. The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties. MOB 2 will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

f. The EIS will analyze Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. At Dyess AFB, proposed activities include an estimated 4.2 million square feet (SF) of construction, 600,000 SF of renovation, and 300,000 SF of demolition. Proposed airspace for B-21 operations out of Dyess AFB include special use airspace (SUA) units over areas in Texas and New Mexico. At Whiteman AFB, proposed activities include an estimated 600,000 SF of construction, 1.7 million SF of renovation, and 85,000 SF of demolition. Proposed airspace for B-21 operations out of Whiteman AFB include SUA units over areas in Missouri and Kansas.

g. The potential impacts of the alternatives and the No Action Alternative that the EIS may examine include impacts to land use, airspace, safety, noise, hazardous materials and solid waste, physical resources (including earth and water resources), air quality, transportation, cultural resources, biological resources, socioeconomics, and environmental justice. The DAF anticipates potential notable noise and socioeconomic impacts from the Proposed Action and action alternatives. Potential noise impacts are expected to be similar to, or less than, those currently experienced at Dyess AFB and Whiteman AFB, including associated airspace. Socioeconomic impacts are anticipated to be primarily beneficial due to the creation of jobs and near-term economic benefits as a result of construction, renovation, and demolition activities. A greater demand for public service professionals may be warranted due to an increase in population. Potential permits that may be required include, but are not limited to, Section 404 of the Clean Water Act, General Construction, Floodplain Development, and National Pollutant Discharge Elimination System.

h. The Proposed Action at Dyess AFB and Whiteman AFB is subject to the Clean Water Act Sections 401, 404, and 404(b)(1) guidelines and has the potential occur in a floodplain and/or wetland. Consistent with the requirements and objectives of Executive Order (EO)

11990, *Protection of Wetlands*, and EO 11988, *Floodplain Management*, as amended by EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, state and federal regulatory agencies with special expertise in wetlands and floodplains will be contacted to request comment. Consistent with EO 11988, EO 13690, and EO 11990, this notice of intent initiates early public review of the Proposed Action and alternatives, which have the potential to be in a floodplain and/or wetland.

i. The DAF will be holding public scoping meetings in areas potentially impacted by the proposal. During the public scoping meetings, the DAF will provide additional information about the B-21 MOB 2 and MOB 3 beddown EIS. The purpose of the meetings and the scoping period is to further solicit input regarding the scope of issues to be addressed and identify environmental issues to be analyzed in depth. Written comments received by the DAF during the public scoping period will be considered in the preparation of the Draft EIS. Please provide substantive comments that identify potential alternatives (in accordance with 40 CFR Part 1502.14(a) and 32 CFR Part 989.8), information, or analyses relevant to the Proposed Action.

j. Scoping comments may be submitted to the DAF at the planned public scoping meetings, via the public website (www.B21EIS.com), or mailed. Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted no later than May 8, 2023.

k. The DAF will host six public scoping meetings to allow members of the public to learn about the project and provide public comments. Public scoping meetings will begin with a 30-minute DAF presentation, followed by an open house/question-and-answer session. Written comments can be submitted at any time during the in-person scoping meetings or submitted electronically via the public website at www.B21EIS.com.

2. Virtual public scoping meetings will be held on the following dates and times:

- Tuesday, April 11, 2023, 5:30 p.m. – 7:30 p.m. CST
- Thursday, April 13, 2023, 5:30 p.m. – 7:30 p.m. CST

To register to attend a **virtual** public scoping meeting, visit www.B21EIS.com. Meeting links and instructions will be distributed after registering and prior to all virtual public scoping meetings. All virtual public scoping meetings can be accessed by phone at 888-788-0099, Webinar ID: 813 5934 9395, Passcode: 570587.

3. In-person public scoping meetings are scheduled for the following dates, times, and locations:

- Tuesday, April 18, 2023, 5:30 p.m. – 7:30 p.m. CST, University of Central Missouri, 108 W. South St., Warrensburg, MO
- Thursday, April 20, 2023, 5:30 p.m. – 7:30 p.m. CST, Knob Noster High School, 504 South Washington Ave., Knob Noster, MO
- Tuesday, April 25, 2023, 5:30 p.m. – 7:30 p.m. CST, Abilene Convention Center, 1100 N 6th St., Abilene, TX

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- Thursday, April 27, 2023, 5:30 p.m. – 7:30 p.m. CST, Tye Community Center, 103 Scott St., Tye, TX

Additional information on the EIS and the environmental impact analysis process can be found on the project website at www.B21EIS.com. Written comments can be submitted at a public scoping meeting, through the project website, or by mailing them to: Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560. Inquiries regarding the DAF proposal should be directed to Dyess AFB Public Affairs, ATTN: B-21 EIS, 7 Lancer Loop, Suite 136, Dyess AFB, TX 79607; (325) 696-4820; or 7bwpa@us.af.mil; or Whiteman AFB Public Affairs, ATTN: B-21 EIS, 509 Spirit Blvd., Bldg. 509, Suite 116, Whiteman AFB, MO 65305; (660) 687-5727; or 509bw.public.affairs@us.af.mil. For printed material requests, the standard U.S. Postal Service shipping timeline will apply.

4. Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted to the website or mailed to Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560 by May 8, 2023.

J K. Kramer

JOSEPH K. KRAMER, Colonel, USAF
Commander

A.3.2 Whiteman AFB Scoping Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

March 7, 2023

MEMORANDUM FOR Federal, State, and Local Public Agencies
Interested Parties
Members of the Public

FROM: 509 BW/CC

SUBJECT: Proposed B-21 Bomber Beddown Main Operating Base (MOB) 2 or MOB 3 at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri

Notice of Public Meetings

The Department of the Air Force (DAF) is issuing this notice to inform state and local agencies of its intent to prepare an Environmental Impact Statement (EIS) for the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri. The DAF's notice of intent to prepare an EIS and hold public scoping meetings was published in the *Federal Register* (FR) on March 24, 2023. The EIS will assess the potential environmental consequences of the proposal to beddown the Department of Defense's new bomber aircraft, the B-21 "Raider," which will eventually replace existing B-1 and B-2 bomber aircraft. The EIS is being prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500–1508 (85 FR 43359, July 16, 2020, as amended by 87 FR 23453, April 20, 2022), the Council on Environmental Quality regulations for implementing NEPA; and the DAF Environmental Impact Analysis Process (32 CFR Part 989).

This notice also serves to invite early public and agency participation in determining the scope of environmental issues and alternatives to be analyzed in the EIS and to identify and eliminate from detailed study the issues that are not significant. To effectively define the full range of issues and concerns to be evaluated in the EIS, the DAF is soliciting scoping comments from interested local, state, and federal agencies, interested American Indian tribes, and interested members of the public.

The beddown of the B-21 will take place through a series of three MOBs, referred to as MOB 1, MOB 2, and MOB 3. The DAF previously selected Ellsworth AFB as the MOB 1 location and is now preparing an EIS to evaluate the potential beddown impacts of MOB 2 or MOB 3 at Dyess AFB, Texas or Whiteman AFB, Missouri. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course (WIC), and Operational Test and Evaluation (OT&E) Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, WIC, OT&E, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and

DEFEND...AVENGE!

infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties. MOB 2 will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

The EIS will analyze Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. At Dyess AFB, proposed activities include an estimated 4.2 million square feet (SF) of construction, 600,000 SF of renovation, and 300,000 SF of demolition. Proposed airspace for B-21 operations out of Dyess AFB include special use airspace (SUA) units over areas in Texas and New Mexico. At Whiteman AFB, proposed activities include an estimated 600,000 SF of construction, 1.7 million SF of renovation, and 85,000 SF of demolition. Proposed airspace for B-21 operations out of Whiteman AFB include SUA units over areas in Missouri and Kansas.

The potential impacts of the alternatives and the No Action Alternative that the EIS may examine include impacts to land use, airspace, safety, noise, hazardous materials and solid waste, physical resources (including earth and water resources), air quality, transportation, cultural resources, biological resources, socioeconomics, and environmental justice. The DAF anticipates potential notable noise and socioeconomic impacts from the Proposed Action and action alternatives. Potential noise impacts are expected to be similar to, or less than, those currently experienced at Dyess AFB and Whiteman AFB, including associated airspace. Socioeconomic impacts are anticipated to be primarily beneficial due to the creation of jobs and near-term economic benefits as a result of construction, renovation, and demolition activities. A greater demand for public service professionals may be warranted due to an increase in population. Potential permits that may be required include, but are not limited to, Section 404 of the Clean Water Act, General Construction, Floodplain Development, and National Pollutant Discharge Elimination System.

The Proposed Action at Dyess AFB and Whiteman AFB is subject to the Clean Water Act Sections 401, 404, and 404(b)(1) guidelines and has the potential occur in a floodplain and/or wetland. Consistent with the requirements and objectives of Executive Order (EO) 11990, *Protection of Wetlands*, and EO 11988, *Floodplain Management*, as amended by EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, state and federal regulatory agencies with special expertise in wetlands and floodplains will be contacted to request comment. Consistent with EO 11988, EO 13690, and EO 11990, this notice of intent initiates early public review of the Proposed Action and alternatives, which have the potential to be in a floodplain and/or wetland.

The DAF will be holding public scoping meetings in areas potentially impacted by the proposal. During the public scoping meetings, the DAF will provide additional information about the B-21 MOB 2 and MOB 3 beddown EIS. The purpose of the meetings and the scoping period is to further solicit input regarding the scope of issues to be addressed and identify environmental issues to be analyzed in depth. Written comments received by the DAF during the public scoping period will be considered in the preparation of the Draft EIS. Please provide substantive comments that identify potential alternatives (in accordance with 40 CFR Part 1502.14(a) and 32 CFR Part 989.8), information, or analyses relevant to the Proposed Action.

Scoping comments may be submitted to the DAF at the planned public scoping meetings, via the public website (www.B21EIS.com), or mailed. Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted no later than May 8, 2023.

The DAF will host six public scoping meetings to allow members of the public to learn about the project and provide public comments. Public scoping meetings will begin with a 30-minute DAF presentation, followed by an open house/question-and-answer session. Written comments can be submitted at any time during the in-person scoping meetings or submitted electronically via the public website at www.B21EIS.com.

Virtual public scoping meetings will be held on the following dates and times:

- Tuesday, April 11, 2023, 5:30 p.m. – 7:30 p.m. CST
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To register to attend a **virtual** public scoping meeting, visit www.B21EIS.com. Meeting links and instructions will be distributed after registering and prior to all virtual public scoping meetings. All virtual public scoping meetings can be accessed by phone at 888-788-0099, Webinar ID: 813 5934 9395, Passcode: 570587.

In-person public scoping meetings are scheduled for the following dates, times, and locations:

- Tuesday, April 18, 2023, 5:30 p.m. – 7:30 p.m. CST, University of Central Missouri, 108 W. South St., Warrensburg, MO
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- Thursday, April 27, 2023, 5:30 p.m. – 7:30 p.m. CST, Tye Community Center, 103 Scott St., Tye, TX

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Additional information on the EIS and the environmental impact analysis process can be found on the project website at www.B21EIS.com. Written comments can be submitted at a public scoping meeting, through the project website, or by mailing them to: Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560. Inquiries regarding the DAF proposal should be directed to Dyess AFB Public Affairs, ATTN: B-21 EIS, 7 Lancer Loop, Suite 136, Dyess AFB, TX 79607; (325) 696-4820; or 7bwpa@us.af.mil; or Whiteman AFB Public Affairs, ATTN: B-21 EIS, 509 Spirit Blvd., Bldg. 509, Suite 116, Whiteman AFB, MO 65305; (660) 687-5727; or 509bw.public.affairs@us.af.mil. For printed material requests, the standard U.S. Postal Service shipping timeline will apply.

Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted to the website or mailed to Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560 by May 8, 2023.

DANIEL C. DIEHL, Colonel, USAF
Commander

A.3.3 Scoping Period Extension Notification Letter

DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

March 29, 2023

MEMORANDUM FOR Federal, State, and Local Public Agencies
Interested Parties
Members of the Public

FROM: Christopher Moore, DAF
Air Force Civil Engineer Center
National Environmental Policy Act Division (AFCEC/CZN)

SUBJECT: Proposed B-21 Bomber Beddown Main Operating Base (MOB) 2 or MOB 3 at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri

Notice of Public Scoping Comment Period Extension

This notice serves as a correction to the Notice of Public Meetings recently sent out regarding the Department of the Air Force's (DAF) intent to prepare an Environmental Impact Statement (EIS) for the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri. The DAF's notice of intent to prepare an EIS and hold public scoping meetings was published in the *Federal Register* (FR) on March 27, 2023, not March 24, 2023, as previously indicated. As a result, the public scoping comment period has been extended to May 10, 2023. Information regarding public scoping meeting dates and times, which have not changed, and submitting comments provided in the previous notice is included below for your convenience.

As provided in the previous notice, the DAF will be holding public scoping meetings in areas potentially impacted by the proposal. During the public scoping meetings, the DAF will provide additional information about the B-21 MOB 2 and MOB 3 beddown EIS. The purpose of the meetings and the scoping period is to further solicit input regarding the scope of issues to be addressed and identify environmental issues to be analyzed in depth. Written comments received by the DAF during the public scoping period will be considered in the preparation of the Draft EIS. Please provide substantive comments that identify potential alternatives (in accordance with 40 CFR Part 1502.14(a) and 32 CFR Part 989.8), information, or analyses relevant to the Proposed Action.

Scoping comments may be submitted to the DAF at the planned public scoping meetings, via the public website (www.B21EIS.com), or mailed. Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted no later than May 10, 2023.

The DAF will host six public scoping meetings to allow members of the public to learn about the project and provide public comments. Public scoping meetings will begin with a 30-minute DAF presentation, followed by an open house/question-and-answer session. Written comments can be submitted at any time during the in-person scoping meetings or submitted electronically via the public website at www.B21EIS.com.

Virtual public scoping meetings will be held on the following dates and times:

- Tuesday, April 11, 2023, 5:30 p.m. – 7:30 p.m. CST
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- Thursday, April 27, 2023, 5:30 p.m. – 7:30 p.m. CST, Tye Community Center, 103 Scott St., Tye, TX

Additional information on the EIS and the environmental impact analysis process can be found on the project website at www.B21EIS.com. Written comments can be submitted at a public scoping meeting, through the project website, or by mailing them to: Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560. Inquiries regarding the DAF proposal should be directed to Dyess AFB Public Affairs, ATTN: B-21 EIS, 7 Lancer Loop, Suite 136, Dyess AFB, TX 79607; (325) 696-4820; or 7bwpa@us.af.mil; or Whiteman AFB Public Affairs, ATTN: B-21 EIS, 509 Spirit Blvd., Bldg. 509, Suite 116, Whiteman AFB, MO 65305; (660) 687-5727; or 509bw.public.affairs@us.af.mil. For printed material requests, the standard U.S. Postal Service shipping timeline will apply.

Comments will be accepted at any time during the environmental impact analysis process. However, to ensure the DAF has sufficient time to consider public input in the preparation of the Draft EIS, scoping comments should be submitted to the website or mailed to Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, GA 30560 by May 10, 2023.

CHRISTOPHER MOORE, USAF
Program Manager, AFCEC NEPA Division

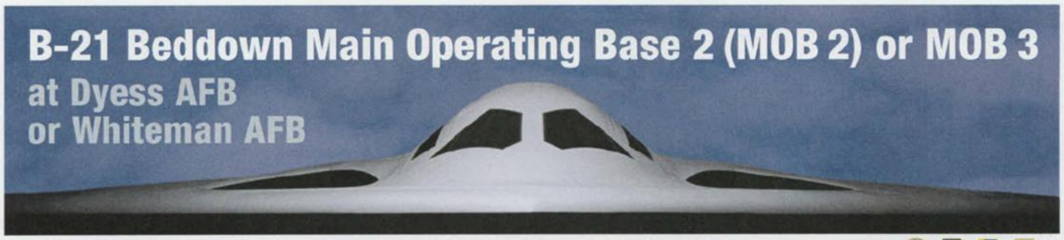
A.4 PUBLIC SCOPING SUBSTANTIVE COMMENT LETTERS

Substantive comment letters received during the public scoping period are listed in Table A-5. Please note that the comments are presented exactly as they were submitted.

Table A-5. Substantive Scoping Comment Letters

Last Name	First Name	Organization/Entity	Comment [a]
Green	Don	City of Abilene	[Refer to the comment letter on the following pages.]
Hanke	T.K.		"My only comment concerns either site.Since the bases can been seen on Google maps,could you utilize some kind of concealment/coveringto hide the number of aircraft stationed there?"
Hanson	Rick	Texas Parks and Wildlife Department	[Refer to the comment letter on the following pages.]
Senter	Scott		[Refer to the comment letter on the following pages.]

Note:
a. Short comments are presented in this table exactly as they were submitted. Refer to the pages after this table for additional, more lengthy comments.



ENVIRONMENTAL IMPACT STATEMENT

Written Comment Form

DATE: 4/25/23

PRIVACY ACT ADVISORY: Private addresses provided will be compiled to develop the mailing list for those individuals requesting copies of the Draft EIS. However, only the names of the individuals making comments and specific comments will be included in the Draft EIS. Personal home addresses and phone numbers will not be published in the Draft EIS.

Substantive comments are those that suggest analysis, methodologies, or provide information for study in the Draft EIS; or that identify potential impacts, reasonable alternatives, or feasible mitigation. Non-substantive comments are those that express a conclusion, an opinion, a vote for or against the proposed action or a particular alternative, or otherwise state a personal preference or opinion. THANK YOU FOR YOUR INPUT. COMMENTS SHOULD BE POSTMARKED BY May 10, 2023 TO BE CONSIDERED IN THE DRAFT EIS.

PLEASE PRINT LEGIBLY.

① DYESS HAS ABILENE REGIONAL (ABI) AIRPORT ACROSS TOWN THAT PROVIDES SCHEDULED AIR SERVICE. IS THAT GIVEN CONSIDERATION AND WEIGHT RELATED TO THE DISTANCE TO THE NEAREST AIR CARRIER AIRPORT TO WHITEMAN? CONSIDERATIONS ARE QUALITY OF LIFE FOR AIRMEN/OFFICERS TRAVELING, AND MORE CARBON EMISSIONS TRAVELING TO A DISTANT AIRPOR.

② ABI HAS 24/7 ATCT SERVICES PROVIDED BY FAA THAT SUPPLEMENTS DYESS' TOWER WHEN IT'S CLOSED.

Name: DON GREEN

[redacted]

☑ Yes, include my name and address on the mailing list so I can receive information on the B-21 Draft EIS.

☐ No, do not include my name and address on the mailing list.

All comments will be fully considered in the Draft EIS without providing a full address.

1

Good evening, My Name is Scott Senter, Broker with Better Homes & Gardens Senter, REALTORS thank you for being here.

Our family has been in the Residential & Commercial Real Estate Business in Abilene since 1957

Abilene is Poised for the B-21 Bomber to arrive, based on the following Socio-Economic Statistics

Per Town Charts.Com, Oct. 2022 Abilene's Livability Score is 75, which is considered Exceptional.

Housing cost are remaining affordable (relatively) with our cost of living 5% lower than the Texas Average

March
~~Today Present~~ housing inventory Per Local Board of REALTORS is 342 houses in Abilene and Total of our Three Counties is 547

There are the over 1,150 lots now under Development plus ACU has announced 911 lots on N 10th & there are other infill expansions of existing Subdivisions of many additional lots

Over 200 Single family & Duplex Rentals are presently offered on the local Board of REALTORS List.

At Approximately 8% vacancy 700 existing apartment units are available in our market of 9,214 surveyed. ~~Plus~~ PLUS All The Individual owned Rent Properties in town

There are over 700 new Apartment units under construction or near completion and 341 new units planned in the coming years per the local appraisal district

Dyess and Abilene are B-21 Ready and Able

1

TEXAS PARKS & WILDLIFE

Life's better outside.®

May 2, 2023

Mr. Christopher Moore, DAF
Air Force Civil Engineer Center
National Environmental Policy Action Division

RE: Proposed B-21 Bomber Beddown Main Operating Base (MOB) 2 or MOB 3 at Dyess Air Force Base (AFB), Texas or Whiteman AFB, Missouri

Dear Mr. Moore:

Texas Parks and Wildlife Department (TPWD) has received the notice of public scoping regarding the proposed project referenced above. TPWD staff has reviewed the information provided and offer the following comments concerning this project.

Project Description

The Department of the Air Force intends to prepare an Environmental Impact Statement (EIS) for the B-21 MOB 2 or MOB 3 Beddown at Dyess AFB, Texas or Whiteman AFB, Missouri and is seeking scoping comments on the proposed project.

Parks and Wildlife Code, Section 68.015

Parks and Wildlife Code Section 68.015 regulates state listed threatened and endangered animal species. The capture, trap, take, or killing of state listed threatened and endangered animal species is unlawful unless expressly authorized under a permit issued by the U.S Fish and Wildlife Service or TPWD. A copy of *TPWD Guidelines for Protection of State Listed Species*, which includes a list of penalties for take of species, can be found on the TPWD website.

> **Recommendation:** TPWD recommends reviewing the most current TPWD county list of rare, threatened, and endangered species for Taylor County. These county lists are available on the TPWD website. TPWD recommends the EIS evaluate potential impacts from the proposed project activities to rare, threatened, and endangered species.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

1

Mr. Christopher Moore
Page 2
May 2, 2023

Future correspondence regarding this project can be submitted to WHAB@tpwd.texas.gov.

Please contact me at Richard.Hanson@tpwd.texas.gov or (806) 761-4930 ext. 4936 if you have any questions.

Sincerely,

Rick Hanson

Rick Hanson
Ecological and Environmental Planning Program
Wildlife Division

RH: 50457

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APPENDIX B

AIR QUALITY CALCULATIONS

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B. AIR QUALITY CALCULATIONS

This appendix presents an overview of the Clean Air Act (CAA) requirements, as well as calculations, including the assumptions used for the air quality analyses presented in the Environmental Impact Statement (EIS).

B.1 AIR QUALITY PROGRAM OVERVIEW

To protect public health and welfare, the U.S. Environmental Protection Agency (EPA) has developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for six "criteria" pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (40 Code of Federal Regulations [CFR] 50).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Texas Commission on Environmental Quality is the state agency that regulates air quality emissions sources in Texas under the authority of the federal CAA and amendments, federal regulations, and state laws. In Missouri, the Missouri Department of Natural Resources has this authority.

Both Texas and Missouri have adopted the federal NAAQS as shown in Table B-1. Based on measured ambient air pollutant concentrations, EPA designates areas of the United States as having air quality better than the NAAQS (attainment), worse than the NAAQS (nonattainment), and unclassifiable. The areas that cannot be classified (on the basis of available information) as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment areas until proven otherwise. Attainment areas can be further classified as "maintenance" areas, which are areas previously classified as nonattainment areas but where air pollutant concentrations have been successfully reduced to levels below the standard. Maintenance areas are subject to special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. Both Taylor County, Texas, and Johnson County, Missouri, are currently in attainment for all criteria pollutants (EPA, 2023a).

A general conformity analysis is required to be conducted for areas designated as nonattainment or maintenance of the NAAQS if the action's direct and indirect emissions have a potential to emit one or more of the six criteria pollutants at or above concentrations standards listed in Table B-1 or the *de minimis* emission rate thresholds in Table B-2 or Table B-3.

Table B-1. Summary of National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15µg/m³ [(a)]	Not to be exceeded more than once per year
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb [(b)]	Annual mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm [(c)]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12 µg/m³	annual mean, averaged over 3 years
		secondary	1 year	15 µg/m³	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m³	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m³	Not to be exceeded more than once per year on the average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb[(d)]	99th percentile of 1-hour daily maximum concentrations averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: (EPA, 2023b)

Key: ≤ = less than or equal to; µg/m³ = micrograms per cubic meter; CO = carbon monoxide; O_3 = ozone; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; Pb = lead; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide

Notes:

a. In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

b. The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

c. Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

d. The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

Table B-2. Emission Rates for Criteria Pollutants in Nonattainment Areas [a]

Pollutant	Emission Rate (Tons/Year)
Ozone (VOCs or NO_x)	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas outside an ozone transport region	100
VOC	50
NO_x	100
CO: all nonattainment areas	100
SO_2 or NO_2: all nonattainment areas	100
PM_{10}	
Moderate nonattainment areas	100
Serious nonattainment areas	70
$PM_{2.5}$ (direct emissions, SO_2, NO_x, VOC, and ammonia)	
Moderate nonattainment areas	100
Serious nonattainment areas	70
Pb: all nonattainment areas	25

Source: (EPA, 2023c)

Key: CO = carbon monoxide; NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound

Note:

a. *De minimis* threshold levels for conformity applicability analysis.

Table B-3. Emission Rates for Criteria Pollutants in Attainment (Maintenance) Areas [a]

Pollutant	Emission Rate (Tons/Year)
Ozone (NO_x, SO_2, or NO_2): all maintenance areas	100
Ozone (VOCs)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
CO: all maintenance areas	100
PM_{10}: all maintenance areas	100
$PM_{2.5}$ (Direct emissions, SO_2, NO_x, VOC)	100
Pb: All maintenance areas	25

Source: (EPA, 2023c)

Key: CO = carbon monoxide; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound

Note:

a. *De minimis* threshold levels for conformity applicability analysis.

Each state is required to develop a State Implementation Plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds, that is, 100 or 250 tons per year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. Table B-4 lists the PSD significant emissions rate thresholds for selected criteria pollutants (40 CFR Part 51.166).

Table B-4. Criteria Pollutant Significant Emissions Rate Increases Under PSD Regulations

Pollutant	Significant Emissions Rate (Tons/Year)
PM_{10}	15
$PM_{2.5}$	10
Total suspended particulates	**25**
SO_2	40
NO_x	40
Ozone (VOCs)	40
CO	100

Source: Title 40 CFR Part 51.166

Key: CO = carbon monoxide; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; PSD = Prevention of Significant Deterioration; SO_2 = sulfur dioxide; VOC = volatile organic compound

The goals of the PSD program are to (1) ensure economic growth while preserving existing air quality; (2) protect public health and welfare from adverse effects that might occur even at pollutant levels better than the NAAQS; and (3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using best available control technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in Table B-5. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development.

Table B-5. Federal Allowable Pollutant Concentration Increases Under PSD Regulations

Pollutant	Averaging Time	Maximum Allowable Concentration ($\mu g/m^3$)		
		Class I	Class II	Class III
PM_{10}	Annual	4	17	34
	24-hour	8	30	60
SO_2	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO_2	Annual	2.5	25	50

Source: Title 40 CFR Part 51

Key: NO_2 = nitrogen dioxide; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; PSD = Prevention of Significant Deterioration; SO_2 = sulfur dioxide; $\mu g/m^3$ = micrograms per cubic meter

The Ambient Monitoring Program measures levels of air pollutants throughout the state. The data are used to determine compliance with air standards established for five compounds and evaluate the need for special controls for various other pollutants.

The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated, and plans are needed to reduce pollutant concentration levels to be in attainment with the standards. Also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

B.2 REGULATORY COMPARISONS

To evaluate air emissions and their impact on the overall region of influence (ROI), the emissions associated with the Proposed Action activities were evaluated in accordance with the tiered approach outlined in the *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume I and Volume II – Advanced Assessments*. The first step was to conduct an assessment to determine if the action was exempt from air quality analysis. The Proposed Action was not subject to any categorical exclusions or General Conformity exemptions. Since the Proposed Action is not subject to any exemptions under Tier I, a quantitative assessment (Tier II) was completed. The Tier II assessment requires a formal evaluation of air impacts based on a quantitative net change emission inventory of the annual net total direct and indirect emissions of pollutants of concern.

Air quality impacts were evaluated quantitatively based on a two-pronged approach. Potential impacts to air quality were first identified as the total emissions of any primary pollutant that equals 250 tons per year for that pollutant based on the federal New Source Review/PSD major stationary source threshold. In addition to criteria pollutants, greenhouse gases were quantified for the Proposed Action and alternatives for purposes of disclosing the local net effects (increase or decrease) and for their potential usefulness in making a reasoned choice among alternatives.

However, since the majority of the emissions related to the Proposed Action and alternatives would result from activities associated with mobile sources, a second-level indicator was deemed appropriate. Consequently, each pollutant was also evaluated and compared with the total ROI emissions on a pollutant-by-pollutant basis against the ROI's 2017 National Emissions Inventory (NEI) data.

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines *significance* in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of the action must be analyzed with respect to the setting of the Proposed Action and based relative to the severity of the impact. The CEQ National Environmental Policy Act Regulations (40 CFR 1508.27(b)) provide 10 key factors to consider in determining an impact's intensity.

Intensity refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

> (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
>
> (2) The degree to which the proposed action affects public health or safety.
>
> (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
>
> (4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
>
> (5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
>
> (6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

To provide a more conservative analysis, the affected counties where the respective airfields are located and those underlying the Special Use Airspace were selected as the ROIs instead of the EPA-designated Air Quality Control Regions, which are much larger areas. Air quality impacts would be considered significant if the increases in annual emissions of a pollutant would be anticipated to: (1) cause or contribute to a violation of any national or state ambient air quality standard; (2) expose sensitive receptors to substantially increased pollutant concentrations; (3) exceed any evaluation criteria established by a SIP or permit limitations/requirements; or (4) be anticipated to cause an exceedance of the NAAQS or contribute to nonattainment.

The Air Conformity Applicability Model (ACAM) Version 5.0.16 was utilized to provide a level of consistency with respect to emissions factors and calculations. The ACAM provides estimated air emissions from proposed federal actions in areas designated as nonattainment and/or maintenance for each specific criteria and precursor pollutant as defined in the NAAQS. Emission factors for aircraft were obtained from ACAM. Equations and emission factors can be found in this appendix in Section B.4 (Project Calculations).

B.3 NATIONAL EMISSIONS INVENTORY

The NEI is operated under the EPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous state and local air agencies, tribes, and industries. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants. The database includes estimates of annual emissions, by source, of air pollutants in each area of the country on a yearly basis. The NEI includes emission estimates for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county-level estimates for area, mobile, and other sources, are currently available for years 2011, 2014, and 2017 for criteria pollutants and hazardous air pollutants. The 2017 NEI data were finalized in April 2020 and last updated on July 7, 2020, so those data were used in all analyses.

Criteria air pollutants are those for which the EPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

- Carbon monoxide
- Nitrogen oxides
- Sulfur dioxide
- Particulate matter (with a diameter less than or equal to 10 and 2.5 microns)

The NEI also includes emissions of volatile organic compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with nitrogen oxides in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources:

- Point sources. Stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A “major” source emits a threshold amount (or more) of at least one criteria pollutant and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.
- Area sources. Small point sources such as a home or office building or a diffuse stationary source such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example; for instance, a single dry cleaner within an inventory area typically will not qualify as a point source, but collectively the emissions from all of the dry-cleaning facilities in the inventory area may be significant and, therefore, must be included in the inventory.
- Mobile sources. Any kind of vehicle or equipment with a gasoline or diesel engine (such as an airplane or ship).

The following are the main sources of criteria pollutant emissions data for the NEI:

- For electric generating units: EPA’s Emission Tracking System/Continuous Emissions Monitoring Data and Department of Energy fuel use data.
- For other large stationary sources: state data and older inventories where state data were not submitted.
- For on-road and nonroad mobile sources: the Federal Highway Administration’s estimate of vehicle miles traveled and emission factors from EPA’s MOVES 2014a Model.
- EPA’s Clean Air Market program supplies emissions data for electric power plants.

- For stationary area sources: state data, EPA-developed estimates for some sources, and older inventories where state or EPA data were not submitted.
- State and local environmental agencies supply most of the point source data.

B.4 PROJECT CALCULATIONS

This appendix presents an export of results directly from the air quality modeling software, retaining the organizational headings, text, and table formatting produced by the software.

B.4.1 Dyess AFB Alternative Detail Air Conformity Applicability Model Report

1. General Information

- Action Location
Base: DYESS AFB
State: Texas
County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:
The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties.

The need for the Proposed Action stems from advancements in the technology that is available to potential adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary nations from taking action and that can respond effectively to support national defense priorities if and when called upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and long-range strike missions into the future; therefore, a new, more technologically capable system must be developed and fielded to support the nation's defense.

- Action Description:
Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

- Point of Contact

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

- Activity List:

Activity Type		Activity Title
2.	Personnel	Personnel - Military
3.	Personnel	Personnel - Civilian and Contractor
4.	Aircraft	B-21
5.	Aircraft	B-1B LTOs
6.	Construction / Demolition	Dyess Construction
7.	Construction / Demolition	Dyess WGF
8.	Aircraft	B-21 TGOs
9.	Aircraft	B-1B Closed Patterns
10.	Aircraft	B-1B Airspace Operations

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. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Taylor

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Military

- Activity Description:
Military - 695
- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.004025
SO_x	0.010439
NO_x	0.592392
CO	14.179602
PM 10	0.018274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.015642
Pb	0.000000
NH_3	0.102566
CO_2e	1448.6

2.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 695
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)

2.3 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

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502

LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

2.5 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

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Civilian and Contractor

- Activity Description:
Civilian - 46
Contractor - 50

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.138685
SO_x	-0.001442
NO_x	-0.081827
CO	-1.958621
PM 10	-0.002524

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.002161
Pb	0.000000
NH_3	-0.014167
CO_2e	-200.1

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 0
Civilian Personnel: 46
Support Contractor Personnel: 50
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)

3.3 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

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796

MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

3.5 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

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21

- Activity Description:
1,140 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	5.620168
SO_x	9.627475
NO_x	147.498209
CO	63.257429
PM 10	15.164314

Pollutant	Emissions Per Year (TONs)
PM 2.5	13.427448
Pb	0.000000
NH_3	0.000000
CO_2e	21335.5

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	2.667392
SO_x	5.847604
NO_x	73.380182
CO	42.622448
PM 10	12.741708

Pollutant	Emissions Per Year (TONs)
PM 2.5	11.103008
Pb	0.000000
NH_3	0.000000
CO_2e	17844.6

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1140
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	22.66
Approach [Approach] (mins):	7.37
Climb Out [Intermediate] (mins):	1.41
Takeoff [Military] (mins):	1.06
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
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)

4.4 Auxiliary Power Unit (APU)

4.4.1 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
2	4	No	131-3A	

4.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

4.4.3 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

4.5 Aircraft Engine Test Cell

4.5.1 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):	1
Idle Duration (mins):	12
Approach Duration (mins):	27
Intermediate Duration (mins):	9
Military Duration (mins):	12
After Burner Duration (mins):	0

4.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

4.5.3 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)

4.6 Aerospace Ground Equipment (AGE)

4.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 1140

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D

1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

4.6.2 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	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

4.6.3 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

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B LTOs

- Activity Description:
1172 LTOs annually

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-3.764283
SO_x	-6.226297
NO_x	-73.180537
CO	-85.808284
PM 10	-14.786680

Pollutant	Emissions Per Year (TONs)
PM 2.5	-13.234268
Pb	0.000000
NH_3	0.000000
CO_2e	-16514.5

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.424447
SO_x	-5.427127
NO_x	-51.753542
CO	-79.743874
PM 10	-13.968087

Pollutant	Emissions Per Year (TONs)
PM 2.5	-12.469553
Pb	0.000000
NH_3	0.000000
CO_2e	-15085.0

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-1B
Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1172
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	22.66
Approach [Approach] (mins):	6.09
Climb Out [Intermediate] (mins):	1.3
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	1.44

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	9
AfterBurn (mins):	3

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)

5.4 Auxiliary Power Unit (APU)

5.4.1 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	2	No	GTCP 165-9	

5.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
GTCP 165-9	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

5.4.3 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

5.5 Aircraft Engine Test Cell

5.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 9
After Burner Duration (mins): 3

5.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

5.5.3 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)

5.6 Aerospace Ground Equipment (AGE)

5.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 1172

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	2.5	No	Bomb Lift	MJ-40
1	2.2	No	Generator Set	A/M32A-86D
1	4	No	Heater	H1
1	2.4	No	Heater/Air Conditioner	B-1B Heater/Air Conditioner
1	0.5	No	Light Cart	NF-2
1	0.5	No	Start Cart	A/M32A-95

5.6.2 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	CO_2e
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
B-1B Heater/Air Conditioner	17.1	0.258	0.121	7.659	1.409	0.152	0.148	389.3
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-95	0.0	0.070	0.264	1.470	5.860	0.110	0.107	190.4

5.6.3 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

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Dyess Construction

- Activity Description:
See Section 2.3.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	21.232793
SO_x	0.051361
NO_x	16.884463

Pollutant	Total Emissions (TONs)
PM 2.5	0.630445
Pb	0.000000
NH_3	0.030575

CO	18.931890
PM 10	572.728795

CO_2e	5705.6

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 63441
Height of Building to be demolished (ft): 25

- Default Settings Used: Yes

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- 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 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539

Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.2 Site Grading Phase

6.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4764407.8
Amount of Material to be Hauled On-Site (yd^3): 476
Amount of Material to be Hauled Off-Site (yd^3): 476

- 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	2	8
Other Construction Equipment Composite	2	8
Rollers Composite	1	8
Rubber Tired Dozers Composite	3	8

Scrapers Composite	6	8
Tractors/Loaders/Backhoes Composite	2	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

6.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.2.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.3 Trenching/Excavating Phase

6.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 12
Number of Days: 0

6.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 25200
Amount of Material to be Hauled On-Site (yd^3): 2.5
Amount of Material to be Hauled Off-Site (yd^3): 2.5

- 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

6.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.3.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.4 Building Construction Phase

6.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 12
Number of Days: 0

6.4.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 1582315
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

6.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.5 Architectural Coatings Phase

6.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

6.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 1582315
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

6.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.5.4 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

6.6 Paving Phase

6.6.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 2651744

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

6.6.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.6.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

$VOC_P = (2.62 * PA) / 43560$

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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Dyess WGF

- Activity Description:
See Section 2.1.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.950959
SO_x	0.035705
NO_x	11.062384
CO	13.195307
PM 10	262.981963

Pollutant	Total Emissions (TONs)
PM 2.5	0.438996
Pb	0.000000
NH_3	0.006508
CO_2e	3554.8

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 2178000
Amount of Material to be Hauled On-Site (yd^3): 217
Amount of Material to be Hauled Off-Site (yd^3): 217

- 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	2	8
Other Construction Equipment Composite	2	8
Rubber Tired Dozers Composite	2	8
Scrapers Composite	4	8
Tractors/Loaders/Backhoes Composite	2	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

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1
Start Year: 2025

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

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 21300
Amount of Material to be Hauled On-Site (yd^3): 2.1
Amount of Material to be Hauled Off-Site (yd^3): 2.1

- 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 Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60

Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
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): 81620
Height of Building (ft): 25
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

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

7.4 Architectural Coatings Phase

7.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 81620
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

7.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.4.4 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

7.5 Paving Phase

7.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 410911

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	6

Rollers Composite	2	6

- 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

7.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.5.4 Paving Phase Formula(s)

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

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)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21 TGOs

- Activity Description:
2,280 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.175292
SO_x	5.022762
NO_x	81.117868
CO	5.893842
PM 10	16.367431

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.744980
Pb	0.000000
NH_3	0.000000
CO_2e	15180.9

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2280
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 6.01
Climb Out [Intermediate] (mins): 4.99
Takeoff [Military] (mins): 0.68
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B Closed Patterns

- Activity Description:
3,261 TGO annually

- Activity Start Date
Start Month: 1
Start Year: 2025

- Activity End Date
Indefinite: Yes

End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.180876
SO_x	-4.931164
NO_x	-52.153536
CO	-4.282033
PM 10	-12.325752

Pollutant	Emissions Per Year (TONs)
PM 2.5	-11.084040
Pb	0.000000
NH_3	0.000000
CO_2e	-14904.1

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-1B
Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 3261
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	4.22
Climb Out [Intermediate] (mins):	2.88
Takeoff [Military] (mins):	0.56
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B Airspace Operations

- Activity Description:
11,520 minutes annually

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-0.100716	PM 2.5	-3.046644
SO_x	-2.694140	Pb	0.000000
NO_x	-33.110227	NH_3	0.000000
CO	-2.140205	CO_2e	-8142.8
PM 10	-3.399149		

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 2.5	0.000000
SO_x	0.000000	Pb	0.000000
NO_x	0.000000	NH_3	0.000000
CO	0.000000	CO_2e	0.0
PM 10	0.000000		

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-1B
Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 120
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 1
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 11520
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

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)

B.4.2 Dyess AFB Alternative 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 an analysis to assess the potential air quality impact/s associated with the action 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 General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: DYESS AFB
State: Texas
County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

f. Point of Contact:

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

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

_____ applicable
__X__ not applicable

Total 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" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used 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 potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any 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 pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

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

Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	26.799	250	
NOx	98.629	250	
CO	21.269	250	
SOx	0.895	250	
PM 10	836.747	250	Yes
PM 2.5	1.890	250	
Pb	0.000	25	No
NH3	0.125	250	
CO2e	7463.9		

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)

NOT IN A REGULATORY AREA			
VOC	2.615	250	
NOx	70.682	250	
CO	-10.858	250	
SOx	0.808	250	
PM 10	1.036	250	
PM 2.5	0.821	250	
Pb	0.000	25	No
NH3	0.088	250	
CO2e	-1796.5		

The estimated annual net emissions associated with this action temporarily exceed the insignificance indicators. However, the steady state estimated annual net emissions are below the insignificance indicators showing no significant long-term impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

4/2/2023

Brad Boykin, CTR DATE

B.4.3 Dyess AFB Snapshot Scenario Detail Air Conformity Applicability Model Report

1. General Information

- Action Location
Base: DYESS AFB
State: Texas
County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:
The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties.

The need for the Proposed Action stems from advancements in the technology that is available to potential adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary nations from taking action and that can respond effectively to support national defense priorities if and when called upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and long-range strike missions into the future; therefore, a new, more technologically capable system must be developed and fielded to support the nation's defense.

- Action Description:
Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

- Point of Contact

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

- Activity List:

Activity Type		Activity Title
2.	Personnel	Personnel - Military
3.	Personnel	Personnel - Civilian and Contractor
4.	Aircraft	B-21
5.	Aircraft	B-1B LTOs
6.	Construction / Demolition	Dyess Construction
7.	Construction / Demolition	Dyess WGF
8.	Aircraft	B-21 TGOs
9.	Aircraft	B-1B Closed Patterns
10.	Aircraft	B-1B Airspace Operations

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. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Military

- Activity Description:

Military - 695

- Activity Start Date

Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.004025
SO_x	0.010439
NO_x	0.592392
CO	14.179602
PM 10	0.018274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.015642
Pb	0.000000
NH_3	0.102566
CO_2e	1448.6

2.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 695
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)

2.3 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

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

2.5 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

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Civilian and Contractor

- Activity Description:
Civilian - 46
Contractor - 50

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.138685
SO_x	-0.001442
NO_x	-0.081827
CO	-1.958621
PM 10	-0.002524

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.002161
Pb	0.000000
NH_3	-0.014167
CO_2e	-200.1

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 0
Civilian Personnel: 46
Support Contractor Personnel: 50
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)

3.3 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

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

3.5 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

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21

- Activity Description:
1,140 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	5.620168
SO_x	9.627475
NO_x	147.498209
CO	63.257429
PM 10	15.164314

Pollutant	Emissions Per Year (TONs)
PM 2.5	13.427448
Pb	0.000000
NH_3	0.000000
CO_2e	21335.5

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	2.667392
SO_x	5.847604
NO_x	73.380182
CO	42.622448
PM 10	12.741708

Pollutant	Emissions Per Year (TONs)
PM 2.5	11.103008
Pb	0.000000
NH_3	0.000000
CO_2e	17844.6

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1140
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 22.66
Approach [Approach] (mins): 7.37
Climb Out [Intermediate] (mins): 1.41
Takeoff [Military] (mins): 1.06
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
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)

4.4 Auxiliary Power Unit (APU)

4.4.1 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
2	4	No	131-3A	

4.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

4.4.3 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

4.5 Aircraft Engine Test Cell

4.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 12
After Burner Duration (mins): 0

4.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

4.5.3 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)

4.6 Aerospace Ground Equipment (AGE)

4.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 1140

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D
1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

4.6.2 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	CO_2e

MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

4.6.3 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

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B LTOs

- Activity Description:
937.6 LTOs annually

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-3.097208
SO_x	-5.327344
NO_x	-62.323079
CO	-71.309629
PM 10	-12.738686

Pollutant	Emissions Per Year (TONs)
PM 2.5	-11.405325
Pb	0.000000
NH_3	0.000000
CO_2e	-14258.3

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.018741
SO_x	-4.661369
NO_x	-44.890818
CO	-66.253254
PM 10	-12.013862

Pollutant	Emissions Per Year (TONs)
PM 2.5	-10.730637
Pb	0.000000
NH_3	0.000000
CO_2e	-13034.2

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-1B
Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 937.6
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 22.66
Approach [Approach] (mins): 6.09
Climb Out [Intermediate] (mins): 1.3
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 1.44

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	9
AfterBurn (mins):	3

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)

5.4 Auxiliary Power Unit (APU)

5.4.1 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	2	No	GTCP 165-9	

5.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
GTCP 165-9	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

5.4.3 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

5.5 Aircraft Engine Test Cell

5.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 9
After Burner Duration (mins): 3

5.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

5.5.3 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)

5.6 Aerospace Ground Equipment (AGE)

5.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 937.6

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	2.5	No	Bomb Lift	MJ-40
1	2.2	No	Generator Set	A/M32A-86D
1	4	No	Heater	H1
1	2.4	No	Heater/Air Conditioner	B-1B Heater/Air Conditioner
1	0.5	No	Light Cart	NF-2
1	0.5	No	Start Cart	A/M32A-95

5.6.2 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	CO_2e
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0

H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
B-1B Heater/Air Conditioner	17.1	0.258	0.121	7.659	1.409	0.152	0.148	389.3
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-95	0.0	0.070	0.264	1.470	5.860	0.110	0.107	190.4

5.6.3 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

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Dyess Construction

- Activity Description:
See Section 2.3.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	21.232793
SO_x	0.051361
NO_x	16.884463
CO	18.931890
PM 10	572.728795

Pollutant	Total Emissions (TONs)
PM 2.5	0.630445
Pb	0.000000
NH_3	0.030575
CO_2e	5705.6

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 63441
Height of Building to be demolished (ft): 25

- Default Settings Used: Yes

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- 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 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.1.4 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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.2 Site Grading Phase

6.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4764407.8
Amount of Material to be Hauled On-Site (yd^3): 476
Amount of Material to be Hauled Off-Site (yd^3): 476

- 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	2	8
Other Construction Equipment Composite	2	8
Rollers Composite	1	8
Rubber Tired Dozers Composite	3	8
Scrapers Composite	6	8
Tractors/Loaders/Backhoes Composite	2	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

6.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.2.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.3 Trenching/Excavating Phase

6.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 25200
Amount of Material to be Hauled On-Site (yd^3): 2.5
Amount of Material to be Hauled Off-Site (yd^3): 2.5

- 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

6.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.3.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.4 Building Construction Phase

6.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 1582315
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

6.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.5 Architectural Coatings Phase

6.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

6.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 1582315
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

6.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.5.4 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

6.6 Paving Phase

6.6.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 2651744

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

6.6.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

6.6.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location

County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Dyess WGF

- Activity Description:
See Section 2.1.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.950959
SO_x	0.035705
NO_x	11.062384
CO	13.195307
PM 10	262.981963

Pollutant	Total Emissions (TONs)
PM 2.5	0.438996
Pb	0.000000
NH_3	0.006508
CO_2e	3554.8

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 2178000
Amount of Material to be Hauled On-Site (yd^3): 217
Amount of Material to be Hauled Off-Site (yd^3): 217

- 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	2	8
Other Construction Equipment Composite	2	8
Rubber Tired Dozers Composite	2	8
Scrapers Composite	4	8
Tractors/Loaders/Backhoes Composite	2	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

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1

Start Year: 2025

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

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 21300
Amount of Material to be Hauled On-Site (yd^3): 2.1
Amount of Material to be Hauled Off-Site (yd^3): 2.1

- 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 Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
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): 81620
Height of Building (ft): 25
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

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

7.4 Architectural Coatings Phase

7.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 81620
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

7.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.4.4 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

7.5 Paving Phase

7.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 410911

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- 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

7.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.502
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.336
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.820
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.249
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.998
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.796
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.005

7.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: B-21 TGOs

- Activity Description:
2,280 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.175292
SO_x	5.022762
NO_x	81.117868
CO	5.893842
PM 10	16.367431

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.744980
Pb	0.000000
NH_3	0.000000
CO_2e	15180.9

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		12
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		2280
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	6.01
Climb Out [Intermediate] (mins):	4.99
Takeoff [Military] (mins):	0.68
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Taylor
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B Closed Patterns

- Activity Description:
652.2 TGO annually

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.036175
SO_x	-0.986233
NO_x	-10.430707

Pollutant	Emissions Per Year (TONs)
PM 2.5	-2.216808
Pb	0.000000
NH_3	0.000000

CO	-0.856407		CO_2e	-2980.8
PM 10	-2.465150			

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
VOC	0.000000		PM 2.5	0.000000
SO_x	0.000000		Pb	0.000000
NO_x	0.000000		NH_3	0.000000
CO	0.000000		CO_2e	0.0
PM 10	0.000000			

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-1B
Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 652.2
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): 4.22
Climb Out [Intermediate] (mins): 2.88
Takeoff [Military] (mins): 0.56

Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-1B Airspace Operations

- Activity Description:
9,216 minutes annually

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-0.080572	PM 2.5	-2.437316
SO_x	-2.155312	Pb	0.000000
NO_x	-26.488182	NH_3	0.000000
CO	-1.712164	CO_2e	-6514.3
PM 10	-2.719319		

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 2.5	0.000000
SO_x	0.000000	Pb	0.000000
NO_x	0.000000	NH_3	0.000000
CO	0.000000	CO_2e	0.0
PM 10	0.000000		

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-1B

Engine Model: F101-GE-102
Primary Function: Transport - Bomber
Aircraft has After burn: Yes
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1117.00	0.16	1.07	4.10	24.46	2.18	1.96	3234
Approach	4533.00	0.02	1.07	9.16	1.03	4.21	3.79	3234
Intermediate	6557.00	0.04	1.07	13.15	0.85	1.35	1.21	3234
Military	7828.00	0.12	1.07	12.83	0.83	1.68	1.51	3234
After Burn	15314.00	1.46	1.07	16.92	43.49	2.87	2.58	3234

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 120
Flight Operation Cycle Type: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 1
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 0
Climb Out [Intermediate] (mins): 9216
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

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)

B.4.4 Dyess AFB Snapshot Scenario 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 an analysis to assess the potential air quality impact/s associated with the action 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 General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: DYESS AFB
State: Texas
County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

f. Point of Contact:

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

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

_____ applicable
__X__ not applicable

Total 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" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used 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 potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any 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 pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

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

Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	27.631	250	
NOx	157.832	250	
CO	39.621	250	
SOx	6.277	250	
PM 10	849.335	250	Yes
PM 2.5	13.196	250	
Pb	0.000	25	No
NH3	0.125	250	
CO2e	23272.0		

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)

NOT IN A REGULATORY AREA			
VOC	3.447	250	
NOx	129.885	250	
CO	7.494	250	
SOx	6.190	250	
PM 10	13.624	250	
PM 2.5	12.126	250	
Pb	0.000	25	No
NH3	0.088	250	
CO2e	14011.6		

The estimated annual net emissions associated with this action temporarily exceed the insignificance indicators. However, the steady state estimated annual net emissions are below the insignificance indicators showing no significant long-term impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

Brad Boykin, CTR 4/2/2023
DATE

B.4.5 Whiteman AFB Alternative Detail Air Conformity Applicability Model Report

1. General Information

- Action Location

Base: WHITEMAN AFB
State: Missouri
County(s): Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:

Therefore, the purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties.

The need for the Proposed Action stems from advancements in the technology that is available to potential adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary nations from taking action and that can respond effectively to support national defense priorities if and when called upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and long-range strike missions into the future; therefore, a new, more technologically capable system must be developed and fielded to support the nation's defense.

Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

- Action Description:

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

- Point of Contact

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

- Activity List:

Activity Type		Activity Title
2.	Personnel	Personnel - Military
3.	Personnel	Personnel - Civilian and Contractor
4.	Aircraft	B-2A LTOs
5.	Aircraft	B-21 LTOs
6.	Construction / Demolition	Whiteman Construction
7.	Construction / Demolition	Whiteman WGF
8.	Aircraft	B-21 TGOs
9.	Aircraft	B-2A TGOs

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. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Military

- Activity Description:

Military Personnel - 777 increase under Proposed Action

- Activity Start Date

Start Month: 1
Start Year: 2025

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.116688
SO_x	0.011670
NO_x	0.741694
CO	16.064077
PM 10	0.026463

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.024619
Pb	0.000000
NH_3	0.114836
CO_2e	1564.1

2.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 777
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)

2.3 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

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

2.5 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

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Civilian and Contractor

- Activity Description:
Civilian - (-79)
Contractor - (-234)

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.449837
SO_x	-0.004701
NO_x	-0.298778

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.009917
Pb	0.000000
NH_3	-0.046260

CO	-6.471115	CO_2e	-630.1
PM 10	-0.010660		

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 0
Civilian Personnel: 79
Support Contractor Personnel: 234
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)

3.3 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

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

3.5 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

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-2A LTOs

- Activity Description:
920 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-4.779410
SO_x	-8.638378
NO_x	-123.122483
CO	-68.786724
PM 10	-12.913408

Pollutant	Emissions Per Year (TONs)
PM 2.5	-11.440410
Pb	0.000000
NH_3	0.000000
CO_2e	-19844.1

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.395346
SO_x	-5.562943

Pollutant	Emissions Per Year (TONs)
PM 2.5	-9.503087
Pb	0.000000

NO_x	-62.802896
CO	-52.086423
PM 10	-10.890099

NH_3	0.000000
CO_2e	-16951.3

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 920
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 47.7 (default)
Approach [Approach] (mins): 5.2 (default)
Climb Out [Intermediate] (mins): 1.6 (default)
Takeoff [Military] (mins): 0.7 (default)
Takeoff [After Burn] (mins): 0 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12 (default)
Approach (mins):	27 (default)
Intermediate (mins):	9 (default)
Military (mins):	12 (default)
AfterBurn (mins):	0 (default)

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)

4.4 Auxiliary Power Unit (APU)

4.4.1 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
2	4	No	131-3A	

4.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

4.4.3 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

4.5 Aircraft Engine Test Cell

4.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 12
After Burner Duration (mins): 0

4.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

4.5.3 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)

4.6 Aerospace Ground Equipment (AGE)

4.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 920

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D
1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

4.6.2 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	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0

H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

4.6.3 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

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21 LTOs

- Activity Description:
2,013.16 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	10.368519
SO_x	16.900573
NO_x	228.994073
CO	146.717567
PM 10	22.796506

Pollutant	Emissions Per Year (TONs)
PM 2.5	20.114763
Pb	0.000000
NH_3	0.000000
CO_2e	37372.1

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	5.158581
SO_x	10.324859

Pollutant	Emissions Per Year (TONs)
PM 2.5	16.253890
Pb	0.000000

NO_x	100.111293
CO	110.466196
PM 10	18.789130

NH_3	0.000000
CO_2e	31507.5

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2013.16
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 47.7 (default)
Approach [Approach] (mins): 5.2 (default)
Climb Out [Intermediate] (mins): 1.6 (default)
Takeoff [Military] (mins): 0.7 (default)
Takeoff [After Burn] (mins): 0 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 12 (default)
Approach (mins): 27 (default)
Intermediate (mins): 9 (default)
Military (mins): 12 (default)
AfterBurn (mins): 0 (default)

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)

5.4 Auxiliary Power Unit (APU)

5.4.1 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
2	4	No	131-3A	

5.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

5.4.3 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

5.5 Aircraft Engine Test Cell

5.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 12
After Burner Duration (mins): 0

5.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

5.5.3 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)

5.6 Aerospace Ground Equipment (AGE)

5.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 2013.16

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D
1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

5.6.2 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	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0

H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

5.6.3 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

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Whiteman Construction

- Activity Description:
See Table 2.4.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	10.189079
SO_x	0.030512
NO_x	9.692841
CO	12.337556
PM 10	102.330718

Pollutant	Total Emissions (TONs)
PM 2.5	0.360206
Pb	0.000000
NH_3	0.016863
CO_2e	3298.9

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 85001
Height of Building to be demolished (ft): 25

- Default Settings Used: Yes

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	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

6.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.1.4 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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.2 Site Grading Phase

6.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 850451.2
Amount of Material to be Hauled On-Site (yd^3): 85
Amount of Material to be Hauled Off-Site (yd^3): 85

- 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
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
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

6.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.2.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.3 Trenching/Excavating Phase

6.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 0
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

- 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

6.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.3.4 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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.4 Building Construction Phase

6.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 735632
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

6.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.5 Architectural Coatings Phase

6.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

6.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 735632
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

6.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.5.4 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

6.6 Paving Phase

6.6.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 95691

- 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

6.6.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.6.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location

County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Whiteman WGF

- Activity Description:
See Section 2.1.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.203511
SO_x	0.038775
NO_x	12.076403
CO	14.360093
PM 10	263.000689

Pollutant	Total Emissions (TONs)
PM 2.5	0.456718
Pb	0.000000
NH_3	0.017791
CO_2e	4155.5

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 2178000
Amount of Material to be Hauled On-Site (yd^3): 217
Amount of Material to be Hauled Off-Site (yd^3): 217

- 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	2	8
Other Construction Equipment Composite	2	8
Rubber Tired Dozers Composite	2	8
Scrapers Composite	4	8
Tractors/Loaders/Backhoes Composite	2	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

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1

Start Year: 2025

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

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 21300
Amount of Material to be Hauled On-Site (yd^3): 2.1
Amount of Material to be Hauled Off-Site (yd^3): 2.1

- 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 Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
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): 871200
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

7.4 Architectural Coatings Phase

7.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

7.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 871200
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

7.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.4.4 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

7.5 Paving Phase

7.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 325699

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- 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

7.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

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)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21 TGOs

- Activity Description:
2,850 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.173988
SO_x	4.944107
NO_x	77.771398
CO	5.906712
PM 10	16.377207

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.753298
Pb	0.000000
NH_3	0.000000
CO_2e	14943.2

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234

After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2580
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 5.45
Climb Out [Intermediate] (mins): 4.4
Takeoff [Military] (mins): 0.48
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-2A TGOs

- Activity Description:
1,510 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)

VOC	-0.101830	PM 2.5	-8.634682
SO_x	-2.893644	Pb	0.000000
NO_x	-45.517368	NH_3	0.000000
CO	-3.457029	CO_2e	-8745.8
PM 10	-9.585110		

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 2.5	0.000000
SO_x	0.000000	Pb	0.000000
NO_x	0.000000	NH_3	0.000000
CO	0.000000	CO_2e	0.0
PM 10	0.000000		

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 1510
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0

Approach [Approach] (mins): 5.45
Climb Out [Intermediate] (mins): 4.4
Takeoff [Military] (mins): 0.48
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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)

B.4.6 Whiteman AFB Alternative 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 an analysis to assess the potential air quality impact/s associated with the action 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 General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: WHITEMAN AFB
State: Missouri
County(s): Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

f. Point of Contact:
Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

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

_____ applicable
__X__ not applicable

Total 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" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used 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 potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any 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 pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

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

Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	28.721	250	
NOx	160.338	250	
CO	116.671	250	
SOx	10.389	250	
PM 10	382.022	250	Yes
PM 2.5	15.625	250	
Pb	0.000	25	No
NH3	0.103	250	
CO2e	32113.9		

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.328	250	
NOx	138.569	250	
CO	89.973	250	
SOx	10.320	250	
PM 10	16.691	250	
PM 2.5	14.808	250	

Pb	0.000	25	No
NH3	0.069	250	
CO2e	24659.4		

The estimated annual net emissions associated with this action temporarily exceed the insignificance indicators. However, the steady state estimated annual net emissions are below the insignificance indicators showing no significant long-term impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

_______________________________________ 4/2/2023

Brad Boykin, CTR DATE

B.4.7 Whiteman AFB Snapshot Scenario Detail Air Conformity Applicability Model Report

1. General Information

- Action Location

Base: WHITEMAN AFB
State: Missouri
County(s): Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:

Therefore, the purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will assure allies and partners through the United States' commitment to international treaties.

The need for the Proposed Action stems from advancements in the technology that is available to potential adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary nations from taking action and that can respond effectively to support national defense priorities if and when called upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and long-range strike missions into the future; therefore, a new, more technologically capable system must be developed and fielded to support the nation's defense.

Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great power competition. The installation will support training of crewmembers and personnel in the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.

- Action Description:

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

- Point of Contact

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

- Activity List:

Activity Type		Activity Title
2.	Personnel	Personnel - Military
3.	Personnel	Personnel - Civilian and Contractor
4.	Aircraft	B-2A LTOs
5.	Aircraft	B-21 LTOs
6.	Construction / Demolition	Whiteman Construction
7.	Construction / Demolition	Whiteman WGF
8.	Aircraft	B-21 TGOs
9.	Aircraft	B-2A TGOs

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. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Military

- Activity Description:

Military Personnel - 777 increase under Proposed Action

- Activity Start Date

Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.116688
SO_x	0.011670
NO_x	0.741694
CO	16.064077
PM 10	0.026463

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.024619
Pb	0.000000
NH_3	0.114836
CO_2e	1564.1

2.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 777
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)

2.3 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

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

2.5 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

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel - Civilian and Contractor

- Activity Description:
Civilian - (-79)
Contractor - (-234)

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.449837
SO_x	-0.004701
NO_x	-0.298778
CO	-6.471115
PM 10	-0.010660

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.009917
Pb	0.000000
NH_3	-0.046260
CO_2e	-630.1

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 0
Civilian Personnel: 79
Support Contractor Personnel: 234
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)

3.3 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

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

3.5 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

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-2A LTOs

- Activity Description:
736 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-3.838655
SO_x	-7.247691
NO_x	-105.302244
CO	-55.669453

Pollutant	Emissions Per Year (TONs)
PM 2.5	-9.980349
Pb	0.000000
NH_3	0.000000
CO_2e	-16893.8

PM 10	-11.249891		

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-1.930240	PM 2.5	-8.366797
SO_x	-4.761420	Pb	0.000000
NO_x	-56.523170	NH_3	0.000000
CO	-42.259976	CO_2e	-14501.2
PM 10	-9.560539		

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 736
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 47.7 (default)
Approach [Approach] (mins): 5.2 (default)
Climb Out [Intermediate] (mins): 1.6 (default)
Takeoff [Military] (mins): 0.7 (default)
Takeoff [After Burn] (mins): 0 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12 (default)
Approach (mins):	27 (default)
Intermediate (mins):	9 (default)
Military (mins):	12 (default)
AfterBurn (mins):	0 (default)

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)

4.4 Auxiliary Power Unit (APU)

4.4.1 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
2	4	No	131-3A	

4.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

4.4.3 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

4.5 Aircraft Engine Test Cell

4.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 12
After Burner Duration (mins): 0

4.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

4.5.3 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)

4.6 Aerospace Ground Equipment (AGE)

4.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 736

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D
1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

4.6.2 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	CO_2e

MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

4.6.3 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

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21 LTOs

- Activity Description:
2,013.16 annual LTOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	10.368519
SO_x	16.900573
NO_x	228.994073
CO	146.717567
PM 10	22.796506

Pollutant	Emissions Per Year (TONs)
PM 2.5	20.114763
Pb	0.000000
NH_3	0.000000
CO_2e	37372.1

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	5.158581
SO_x	10.324859
NO_x	100.111293
CO	110.466196
PM 10	18.789130

Pollutant	Emissions Per Year (TONs)
PM 2.5	16.253890
Pb	0.000000
NH_3	0.000000
CO_2e	31507.5

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2013.16
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 47.7 (default)
Approach [Approach] (mins): 5.2 (default)
Climb Out [Intermediate] (mins): 1.6 (default)
Takeoff [Military] (mins): 0.7 (default)
Takeoff [After Burn] (mins): 0 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12 (default)
Approach (mins):	27 (default)
Intermediate (mins):	9 (default)
Military (mins):	12 (default)
AfterBurn (mins):	0 (default)

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)

5.4 Auxiliary Power Unit (APU)

5.4.1 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
2	4	No	131-3A	

5.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

5.4.3 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

5.5 Aircraft Engine Test Cell

5.5.1 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): 1
Idle Duration (mins): 12
Approach Duration (mins): 27
Intermediate Duration (mins): 9
Military Duration (mins): 12
After Burner Duration (mins): 0

5.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

5.5.3 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)

5.6 Aerospace Ground Equipment (AGE)

5.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 2013.16

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2	No	Bomb Lift	MJ-40
1	3	No	Generator Set	A/M32A-86D
1	2	No	Heater	H1
1	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229
1	4	No	Light Cart	NF-2
1	2	No	Start Cart	A/M32A-60A

5.6.2 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	CO_2e

MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
Ace 401	0.0	0.200	0.408	7.970	1.520	0.211	0.205	313.2
MJ-40	0.0	0.210	0.219	0.340	0.210	0.060	0.055	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-229	10.9	0.193	0.077	3.858	2.466	0.083	0.080	246.7
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

5.6.3 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

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Whiteman Construction

- Activity Description:
See Table 2.4.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	10.189079
SO_x	0.030512
NO_x	9.692841
CO	12.337556
PM 10	102.330718

Pollutant	Total Emissions (TONs)
PM 2.5	0.360206
Pb	0.000000
NH_3	0.016863
CO_2e	3298.9

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 85001
Height of Building to be demolished (ft): 25

- Default Settings Used: Yes

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	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

6.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**

Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.1.4 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 * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.2 Site Grading Phase

6.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 850451.2
Amount of Material to be Hauled On-Site (yd^3): 85
Amount of Material to be Hauled Off-Site (yd^3): 85

- 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
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
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

6.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.2.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.3 Trenching/Excavating Phase

6.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1

Start Quarter: 1
Start Year: 2025

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

6.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 0
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

- 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

6.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**

	VOC	SO$_x$	NO$_x$	CO	PM 10	PM 2.5	CH$_4$	CO$_2$e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO$_x$**	**NO$_x$**	**CO**	**PM 10**	**PM 2.5**	**CH$_4$**	**CO$_2$e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO$_x$	NO$_x$	CO	PM 10	PM 2.5	Pb	NH$_3$	CO$_2$e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.3.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.4 Building Construction Phase

6.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 735632
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

6.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.5 Architectural Coatings Phase

6.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

6.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 735632
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

6.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.5.4 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

6.6 Paving Phase

6.6.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

6.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 95691

- 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

6.6.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

6.6.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions
- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Whiteman WGF

- Activity Description:
See Section 2.1.5

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.203511
SO_x	0.038775
NO_x	12.076403
CO	14.360093
PM 10	263.000689

Pollutant	Total Emissions (TONs)
PM 2.5	0.456718
Pb	0.000000
NH_3	0.017791
CO_2e	4155.5

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 2178000
Amount of Material to be Hauled On-Site (yd^3): 217
Amount of Material to be Hauled Off-Site (yd^3): 217

- 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	2	8
Other Construction Equipment Composite	2	8
Rubber Tired Dozers Composite	2	8
Scrapers Composite	4	8
Tractors/Loaders/Backhoes Composite	2	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

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1

Start Year: 2025

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

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 21300
Amount of Material to be Hauled On-Site (yd^3): 2.1
Amount of Material to be Hauled Off-Site (yd^3): 2.1

- 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 Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
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): 871200
Height of Building (ft): 25
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	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders 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

7.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

7.4 Architectural Coatings Phase

7.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

7.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 871200
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

7.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.4.4 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

7.5 Paving Phase

7.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

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

7.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 325699

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- 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

7.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.554
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.075
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.115
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.564
LDDT	000.077	000.001	000.120	002.148	000.003	000.003		000.009	00348.442
HDDV	000.102	000.004	002.283	001.470	000.039	000.036		000.032	01263.110
MC	002.395	000.003	000.686	012.638	000.023	000.021		000.056	00393.000

7.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-21 TGOs

- Activity Description:
2,850 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.173988
SO_x	4.944107
NO_x	77.771398
CO	5.906712
PM 10	16.377207

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.753298
Pb	0.000000
NH_3	0.000000
CO_2e	14943.2

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234

After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2580
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 0
Approach [Approach] (mins): 5.45
Climb Out [Intermediate] (mins): 4.4
Takeoff [Military] (mins): 0.48
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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: Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: B-2A TGOs

- Activity Description:
1,208 annual TGOs

- Activity Start Date
Start Month: 1
Start Year: 2025

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)

VOC	-0.081464	PM 2.5	-6.907746
SO_x	-2.314915	Pb	0.000000
NO_x	-36.413895	NH_3	0.000000
CO	-2.765623	CO_2e	-6996.7
PM 10	-7.668088		

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 2.5	0.000000
SO_x	0.000000	Pb	0.000000
NO_x	0.000000	NH_3	0.000000
CO	0.000000	CO_2e	0.0
PM 10	0.000000		

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: B-2A
Engine Model: F118-GE-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- 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 Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1097.00	0.29	1.07	4.30	20.98	1.25	1.12	3234
Approach	3773.00	0.05	1.07	11.09	2.02	4.70	4.23	3234
Intermediate	6350.00	0.03	1.07	18.01	0.85	3.05	2.75	3234
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 1208
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0

Approach [Approach] (mins):	5.45
Climb Out [Intermediate] (mins):	4.4
Takeoff [Military] (mins):	0.48
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where 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)

B.4.8 Whiteman AFB Snapshot Scenario 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 an analysis to assess the potential air quality impact/s associated with the action 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 General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: WHITEMAN AFB
State: Missouri
County(s): Johnson
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB or Whiteman AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown actions for either location.

The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the WGF.

Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place and all B-1s or B-2s have been removed.

f. Point of Contact:

Name: Brad Boykin
Title: CTR
Organization: Leidos
Email: boykinb@leidos.com
Phone Number: 571-521-8765

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

_____ applicable
__X__ not applicable

Total 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" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used 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 potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any 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 pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

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

Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	29.682	250	
NOx	187.261	250	
CO	130.480	250	
SOx	12.358	250	
PM 10	385.603	250	Yes
PM 2.5	18.812	250	
Pb	0.000	25	No
NH3	0.103	250	
CO2e	36813.3		

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.289	250	
NOx	165.492	250	
CO	103.782	250	
SOx	12.289	250	
PM 10	20.272	250	
PM 2.5	17.995	250	

Pb	0.000	25	No
NH3	0.069	250	
CO2e	29358.9		

The estimated annual net emissions associated with this action temporarily exceed the insignificance indicators. However, the steady state estimated annual net emissions are below the insignificance indicators showing no significant long-term impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

Brad Boykin, CTR | 4/2/2023 DATE

B.5 REFERENCES

40 CFR Part 51.166. *Prevention of significant deterioration of air quality*. Accessed online at https://www.law.cornell.edu/cfr/text/40/51.166#b_23 on August 1, 2023.

EPA. (2023a). *Texas Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants*. Retrieved from U.S. Environmental Protection Agency, Green Book: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. March 31.

EPA. (2023b). *NAAQS Table (National Ambient Air Quality Standards)*. Retrieved August 1, 2023, from U.S. Environmental Protection Agency: https://www.epa.gov/criteria-air-pollutants/naaqs-table.

EPA. (2023c, June 29). *De Minimis Tables*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/general-conformity/de-minimis-tables.

APPENDIX C

LAND USE

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C. LAND USE SUPPORTING INFORMATION

C.1 OFF-BASE LAND USE AND ASSOCIATED NOISE ZONES AND ACCIDENT POTENTIAL ZONES

C.1.1 Dyess Air Force Base

The following is a summary of information contained in the 2015 Dyess Air Force Base (AFB) Air Installations Compatible Use Zones (AICUZ) study (Dyess AFB, 2015). Off-base land use categories are discussed in the context of definitions provided in that study. Note that land use categories have since been updated, and the revised definitions are used for descriptions and analyses associated with the No Action Alternative and Proposed Action.

Land use in most areas adjacent to Dyess AFB consists primarily of open space/low density, with a small amount of residential, commercial, and industrial. A mix of residential, commercial, industrial, and other uses occur in developed portions of Abilene. Abilene's land use policies, which guide development, are discussed in the city's Comprehensive Plan (City of Abilene, 2004). The city recognizes Dyess AFB as a significant asset to the local economy and is committed to promoting policies that will enable the base to meet current and future mission requirements. The city's land use and development strategies include controlling incompatible encroachment around the base. Abilene airport zoning regulations mitigate effects to the public from airfield operations at Dyess AFB.

Approximately 77 percent of land within the Tye city limit consists of open space/low-density use (Dyess AFB, 2015). The city center has an interspersed land use pattern of residential, recreational, and public/quasi-public. Commercial and industrial land use occurs adjacent to I-20. A mixture of mostly residential and industrial land uses occurs along other primary roads. The city of Tye recognizes the noise zones and Accident Potential Zones (APZs) of Dyess AFB as a growth development restraint. In the community of Caps, industrial land use occurs along Highway 277. Land use in the remainder of the community consists primarily of open space/low density, along with small amounts of residential. Taylor County does not have land use regulations. Outside of Abilene, Tye, and Caps, the great majority of county land use in the vicinity of Dyess AFB is open space/low density, along with a small number of residential parcels.

Land use adjacent to Dyess AFB may potentially be affected by noise and safety issues associated with aircraft operations. Noise contours, Clear Zones (CZs), and APZs extend in an approximately north-south axis along the primary runway centerline. The off-base area exposed to various noise levels (outside of CZs and APZs) and accident zones under existing conditions for each land use type, as defined in the 2015 AICUZ study, is shown in Table C-1 and Table C-2. Noise zone contours and accident zones are presented in figures in the AICUZ study.

Table C-1. Off-Base Land Use Area Noise Exposure from the 2015 Dyess AFB AICUZ Study

Land Use Category	Acres Within Noise Zones [a] (dBA DNL)				
	65–69	70–74	75–79	80+	Total
Residential	78	34	0	0	**112**
Commercial	26	24	0	0	**50**
Industrial	83	55	16	0	**154**
Public/Quasi-Public	2	13	8	0	**23**
Open Space/Low Density	5,405	2,484	750	31	**8,670**
Recreational	0	0	0	0	**0**
Total	**5,595**	**2,610**	**774**	**31**	**9,009**

Source: (Dyess AFB, 2015)
Key: dBA = A-weighted decibel; DNL = day-night average sound level
Note:
a. Clear Zone and Accident Potential Zone areas are not included.

Table C-2. Off-Base Land Use Area Within Clear Zones and Accident Potential Zones Identified in the 2015 Dyess AFB AICUZ Study

Land Use Category	Acres Within CZs and APZs			
	CZ	APZ I	APZ II	Total
Residential	0	24	29	**53**
Commercial	0	7	7	**14**
Industrial	0	68	73	**141**
Public/Quasi-Public	5	3	3	**11**
Open Space/Low Density	107	553	809	**1,469**
Recreational	0	0	0	**0**
Total	**112**	**655**	**921**	**1,688**

Source: (Dyess AFB, 2015)
Key: APZ = Accident Potential Zone; CZ = Clear Zone

Overall, about 96 percent of off-base land use within noise zones of 65 dBA DNL or greater consists of open space/low density, which is compatible with all noise levels. Open space/low density accounts for about 87 percent of land use within the combined CZs/APZs. The base's AICUZ and Installation Complex Encroachment Management Action Plan (ICEMAP) studies provide additional information on specific areas within noise zones and APZs under existing conditions. Land use in noise zones within the Abilene city limit occurs north of the installation and consists of open space/low-density use only. However, there are existing incompatible/not recommended land uses within Abilene's extraterritorial jurisdiction (regulated areas outside the city limits) (Dyess AFB, 2018). Five residential areas in the city of Tye occur within noise zones greater than 65 A-weighted decibels (dBA) day-night average sound level (DNL). Two of these areas, along with the Tye RV Park, are considered incompatible. Public/quasi-public land use areas occur in the center of Tye within noise zones of 75+ dBA DNL, which is also considered incompatible. Overall, most land within the 75+ dBA DNL noise zones are open space/low-density, commercial, and agricultural use. In the community of Caps, conditionally compatible land in the 80+ dBA DNL noise zone consists of industrial use. Incompatible use consists of residential parcels in the 75–79 dBA DNL noise zone. Several residential areas in south Caps in the 65–74 dBA DNL noise zone are conditionally compatible.

With regard to accident zones, the northern CZ is entirely within the installation boundary, with the exception of Air Base Road, which traverses the northeastern corner of the CZ. Land in the northern APZ I consists primarily of open space/low-density use but also contains residential, commercial, and public/quasi-public use. Residential land use is considered incompatible, while commercial and public/quasi-public uses are considered conditionally compatible. Land in the northern APZ II also consists primarily of open space/ low-density use but includes large commercial and industrial parcels, which are considered conditionally compatible. The City of Tye General Plan Report proposes to convert several existing large industrial and commercial parcels, along with some small residential lots, to vacant/agricultural use. This would alleviate some of the compatibility issues associated with the APZs. Approximately half of the land in the southern CZ is within the installation boundaries; the remaining land consists of open space/low density, including some agricultural use. There is an industrial use in southern APZ I. Dyess AFB owns restrictive easements to prevent development within this area, and because of these easements, it is considered a compatible use. Without the easements, this area would be conditionally compatible. All land in the southern APZ I and the majority of land in APZ II consists of open space/low density, which is considered compatible. Residential and industrial land in APZ II, which occurs in the community of Caps, are considered conditionally compatible uses. The majority of land in the Landing Zone APZs is within the installation boundary. A small portion of land for the Runway 163/343 Landing Zone extends outside the installation; land use in this area is open space/low density, which is compatible. Dyess AFB has proposed the designation of a Safety Influence Area within the CZs and APZs, which would prevent further development of incompatible and not-recommended land uses in these areas (Dyess AFB, 2018).

C.1.2 Whiteman Air Force Base

The following is a summary of information contained in the 2005 Whiteman AFB AICUZ study (Whiteman AFB, 2015). Off-base land use categories are discussed in the context of definitions provided in that study. Note that land use categories have since been updated, and the revised definitions are used for descriptions and analyses associated with the No Action Alternative and Proposed Action.

The area surrounding Whiteman AFB is primarily agricultural, although some suburban, commercial, and industrial development exists around local communities and along major transportation routes (Whiteman AFB, 2015). The 3,500-acre Knob Noster State Park, which provides recreation areas and open spaces, borders the installation to the west. Zoning ordinances are established within incorporated city limits (e.g., Knob Noster, Warrensburg, and Sedalia), but there is generally no zoning or planning regulations for unincorporated areas of Johnson County (Johnson County EDC, 2021). Most of the unincorporated land of Johnson and Pettis Counties near Whiteman AFB is rural/agricultural production. Residential activity in unincorporated areas consists mostly of low-density single-family homes and farms. Mobile home parks also occur south and southwest of Knob Noster along Route J and Highway 132, respectively.

The primary land use within Knob Noster is residential, along with smaller areas of commercial, public, agricultural, and industrial use (Whiteman AFB, 2015). Knob Noster zoning regulations identify an Airport Overlay District, which is designed to protect people living near Whiteman AFB and to preserve the base's operational stability. A stated objective of the regulations is to facilitate implementation of AICUZ recommendations. The regulations establish land use controls for new and expanded construction, especially within APZs and noise zones. The regulations also prohibit land use that creates potential hazards to aircraft during approach and departure, including structures that violate height restrictions recommended in the AICUZ study. Noise reduction techniques are implemented in some new structures near the installation. The cities of Warrensburg and Sedalia do not have land use controls related to Whiteman AFB specifically (Whiteman AFB, 2014).

Johnson County has established a Whiteman Air Force Base Planning and Zoning area, which is administered by the Johnson County Military Airport Zoning Commission. The commission was formed to protect residences and businesses around Whiteman AFB from flight hazards and to limit encroachment in unincorporated areas. The commission coordinates with the Missouri Military Preparedness and Enhancement Commission and the Whiteman Area Base Coordinating Council on issues related to development and encroachment (Pioneer Trails Regional Planning Commission, 2021). One of the commission's stated objectives is to implement land use planning and development management to help maintain the operational function of Whiteman AFB. The Military Airport Comprehensive Plan for the Unincorporated Areas of Johnson County includes goals to create compatible land uses, reduce encroachment, and provide for public safety near Whiteman AFB (Whiteman AFB, 2011). The county has implemented a Military Airport Zone (MAZ) around the installation to decrease the potential for encroachment by limiting housing density and regulating land use, as required under Missouri Revised Statutes (Chapter 41, Section 41.655). The MAZ extends 3,000 feet from the installation boundary and includes lands within the perimeter of APZ I and APZ II. Overall, encroachment near the base has been limited (Pioneer Trails Regional Planning Commission, 2021).

Land use adjacent to Whiteman AFB may potentially be affected by noise and safety issues associated with aircraft operations. Noise contours, CZs, and APZs extend approximately north and south along the runway centerline. Flight tracks and noise contours extend north and east of Knob Noster (Whiteman AFB, 2015). Residential areas along the approach to Runway 19 and along McPherson Road in the eastern portion of the city are subject to noise levels of 65 to 80 dBA DNL. There are also a small number of residences within APZ I and APZ II.

The off-base area exposed to noise levels above 65 dBA DNL and to accident zones under existing conditions for each land use type, as defined in the 2008 Joint Land Use Study, is shown in Table C-3. The study did not distinguish between specific noise levels or between APZ I and APZ II.

Table C-3. Off-Base Land Use Area Within Noise Zones and Accident Potential Zones Identified in the 2008 Whiteman AFB Joint Land Use Study

Land Use Category	Acreage in Noise Zones [a]	Acreage in APZs
Agriculture	2,488	1,560
Park	0	0
Single Family Residential	303	98
Mobile Home	29	27
Multi-Family Residential	0	0
Commercial	38	31
Industrial/Heavy Commercial/Utility	44	18
School	0	0
Municipal/Institutional	44	27
Vacant/Undeveloped	93	5
Total	**3,039**	**1,766**

Source: (Whiteman AFB, 2008)
Key: AFB = Air Force Base; APZ = Accident Potential Zone
Note:
a. Noise levels of 65 dBA DNL or greater.

Overall, about 82 percent of off-base land use within noise zones of 65 dBA DNL or greater consists of agriculture. This use category is compatible with all noise levels evaluated, from 65 dBA to over 80 dBA DNL. About 10 percent of the land use is categorized as single family residential. The base's AICUZ study recommends that residential land use should be in areas with noise levels below 65 dBA DNL when possible and should not be in areas with noise levels above 75 dBA DNL. The total land area under specific noise zones is not provided in the AICUZ study or Joint Land Use Study. About 88 percent of land use within the combined APZ I and APZ II is agriculture. About 41 percent of the CZ land area is located outside the base boundary and is subject to restrictive easements (Whiteman AFB, 2015).

The base's ICEMAP provides information on specific areas within off-base noise zones and APZs under existing conditions. Numerous parcels located north and south of the Whiteman AFB runway, and which are fully or partially outside the 3,000-foot MAZ, are subject to noise levels from 65 to over 70 dBA DNL. A total of 1,316 acres outside the MAZ are within the 65 to 69 dBA DNL noise contour, and 120 acres are within the 70 to 74 dBA DNL contour. Land use regulations contained in the MAZ Ordinance do not apply to these unregulated parcels. In addition, noise attenuation measures are not required in unregulated areas of Johnson County. Land use that does not conform to current zoning regulations is present within accident zones. Approximately 86 acres of residential development is located north of the installation within APZ I. The total consists of a 25-acre mobile home development in Knob Noster and 61 acres of single-family residential development in unincorporated Johnson County. The City of Knob Noster identifies future land use in the mobile home parcel as industrial/business park, and the MAZ Comprehensive Plan identifies future land use in the single-family residential area as agriculture (Whiteman AFB, 2014). Future land use would conform with AICUZ safety standards only if a landowner changes the current land use. The Whiteman AFB ICEMAP recommends that the installation coordinate with the City of Knob Noster, Johnson County, and the MAZ Commission to identify strategies such as attaining easements on parcels within APZ I, utilizing a transfer of development rights or purchase of development rights program, or considering land acquisition.

C.2 LAND USE CATEGORY DEFINITIONS

Table C-4. Land Use Definitions from Dyess AFB and Whiteman AFB AICUZ Studies

Land Use Category	Definition
Residential	All types of residential activity, such as single- and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.
Commercial	Offices, retail, restaurants, businesses, and other types of commercial activity.
Industrial	Areas and the facilities they contain that are owned or used for manufacturing, warehousing, and other similar uses.
Public/Quasi-Public	Publicly owned lands or lands to which the public has access, such as public buildings, institutional facilities, schools, and churches.
Recreational	Land areas designated for recreational activity, including local parks; wilderness areas and reservations; conservation areas; wildlife areas; and areas designated for trails, hikes, camping, and other similar uses.
Open Space/Low Density	Undeveloped land areas, forested land, agricultural land, grazing areas, water or wetland areas, and areas with residential activity at densities less than or equal to one dwelling per acre.

Key: AFB = Air Force Base; AICUZ = Air Installations Compatible Use Zones

Table C-5. Land Use Definitions Associated with the 2016 USDA Land Use Dataset

Land Use Category	Definition
Water	
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.
Developed	
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
Barren	
Barren Land (Rock/Sand/Clay)	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.

Table C-5. Land Use Definitions Associated with the 2016 USDA Land Use Dataset

Land Use Category	Definition
Forest	
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
Shrubland	
Shrub/Scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
Herbaceous	
Grassland/Herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling but can be utilized for grazing.
Planted/Cultivated	
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
Cultivated Crops	Areas used to produce annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, as well as perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
Wetlands	
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Source: (MRLC, 2016)
Key: % = percent; USDA = U.S. Department of Agriculture

1 C.3 INFORMATION USED FOR LAND USE COMPATIBILITY DETERMINATION

Table C-6. Corresponding Land Use Categories

Current (2016) Land Use Category	Most Closely Corresponding Land Use Category or Categories, AICUZ Studies
Open Water	Open Space/Low Density
Perennial Ice/Snow	Open Space/Low Density
Developed, Open Space	Open Space/Low Density
Developed, Low Intensity	Residential
Developed, Medium Intensity	Residential
Developed, High Intensity	Commercial; Industrial
Barren Land	Open Space/Low Density; Recreational
Deciduous Forest	Open Space/Low Density; Recreational
Evergreen Forest	Open Space/Low Density; Recreational

Table C-6. Corresponding Land Use Categories

Current (2016) Land Use Category	Most Closely Corresponding Land Use Category or Categories, AICUZ Studies
Mixed Forest	Open Space/Low Density; Recreational
Dwarf Scrub	Open Space/Low Density; Recreational
Shrub/Scrub	Open Space/Low Density; Recreational
Grassland/Herbaceous	Open Space/Low Density; Recreational
Sedge/Herbaceous	Open Space/Low Density
Lichens	Open Space/Low Density
Moss	Open Space/Low Density
Pasture/Hay	Open Space/Low Density
Cultivated Crops	Open Space/Low Density
Woody Wetlands	Open Space/Low Density; Recreational
Emergent Herbaceous Wetlands	Open Space/Low Density; Recreational

Key: AICUZ = Air Installations Compatible Use Zones

Table C-7. Generalized Land Use Compatibility

Land Use Category	CZs/APZs			Noise Zones (dBA DNL)			
	CZ	APZ I	APZ II	65–69	70–74	75–79	80+
Open Water	Y	Y	Y	Y	Y	Y	Y
Perennial Ice/Snow	Y	Y	Y	Y	Y	Y	Y
Developed, Open Space	C	Y	Y	Y	C	C	N
Developed, Low Intensity	N	N	C	C	C	N	N
Developed, Medium Intensity	N	N	C	C	C	N	N
Developed, High Intensity	N	C	C	Y	C	C	N
Developed, Mobile Home Parks or Courts	N	N	N	N	N	N	N
Barren Land	Y	Y	Y	Y	Y	Y	Y
Deciduous Forest	C	C	Y	Y	C	C	C
Evergreen Forest	C	C	Y	Y	C	C	C
Mixed Forest	C	C	Y	Y	C	C	C
Dwarf Scrub	C	Y	Y	Y	Y	Y	Y
Shrub/Scrub	C	Y	Y	Y	C	C	C
Grassland/Herbaceous	C	Y	Y	Y	C	C	C
Sedge/Herbaceous	C	Y	Y	Y	Y	Y	Y
Lichens	C	Y	Y	Y	Y	Y	Y
Moss	C	Y	Y	Y	Y	Y	Y
Pasture/Hay	C	Y	Y	Y	Y	Y	Y
Cultivated Crops	C	Y	Y	Y	Y	Y	Y
Woody Wetlands	C	Y	Y	Y	Y	Y	Y
Emergent Herbaceous Wetlands	C	Y	Y	Y	Y	Y	Y

Key: APZ = Accident Potential Zone; CZ = Clear Zone; dBA = A-weighted decibel; DNL = day-night noise level average
Y = compatible use; C = conditionally compatible use; N = non-compatible use

C.4 REFERENCES

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APPENDIX D

BIOLOGICAL RESOURCES

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D. BIOLOGICAL RESOURCES SUPPORTING INFORMATION

D.1 LIST OF THREATENED AND ENDANGERED SPECIES THAT MAY OCCUR IN PROPOSED PROJECT LOCATION AND/OR MAY BE AFFECTED

D.1.1 Dyess Air Force Base

D.1.1.1 U.S. Fish and Wildlife List of Threatened and Endangered Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, TX 78758-4460
Phone: (512) 490-0057 Fax: (512) 490-0974

In Reply Refer To: January 25, 2023
Project Code: 2023-0038002
Project Name: B-21 MOB 2 Beddown EIS

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

1

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

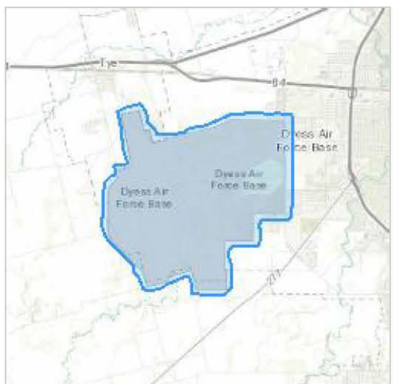
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, TX 78758-4460
(512) 490-0057

1

Project Summary

Project Code: 2023-0038002
Project Name: B-21 MOB 2 Beddown EIS
Project Type: Military Development
Project Description: The beddown of the B-21 Raider will take place through a series of three Main Operating Bases (MOB), referred to as MOB 1, MOB 2, and MOB 3. This MOB 2 EIS will evaluate the environmental impacts associated with beddowns at two candidate basing locations: (1) Dyess AFB, Texas; and (2) Whiteman AFB, MO.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.4209313,-99.83774491044042,14z



Counties: Taylor County, Texas

1

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 4 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Fishes

NAME	STATUS
Sharpnose Shiner *Notropis oxyrhynchus*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:

- All reservoir projects; in-channel projects such as interbasin transfers, water diversions, small impoundments, etc. that may reduce flows of major tributaries eventually flowing into occupied habtiat; commercial/industrial well field projects.

Species profile: https://ecos.fws.gov/ecp/species/6492

Smalleye Shiner *Notropis buccula*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:

- All reservoir projects; in-channel projects such as interbasin transfers, water diversions, small impoundments, etc. that may reduce flows of major tributaries eventually flowing into occupied habtiat; commercial/industrial well field projects.

Species profile: https://ecos.fws.gov/ecp/species/1774

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

1

IPaC User Contact Information

Agency: Air Force
Name: Sarah Bresnan Rauch
Address: 13397 Lakefront Drive, Suite 100
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State: MO
Zip: 63045
Email sarah.e.bresnan@leidos.com
Phone: 3144439111

1 ## D.1.1.2 Taylor County, Texas – TPWD List of Rare, Threatened, and Endangered Species

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Amphibians	*Anaxyrus woodhousii*	Woodhouse's toad			N	G5	SU	Y	Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.
Birds	*Plegadis chihi*	white-faced ibis		T	N	G5	S4B	Y	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.
Birds	*Haliaeetus leucocephalus*	bald eagle			N	G5	S3B,S3N	Y	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds
Birds	*Laterallus jamaicensis*	black rail	PT		N	G3	S2	Y	Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia.
Birds	*Charadrius montanus*	mountain plover			N	G3	S2	Y	Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous.

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Birds	*Leucophaeus pipixcan*	Franklin's gull			N	G5	S2N	Y	Large prairie marshes. They prefer areas with low vegetation density or areas along the interface between cattails and open water.
Birds	*Athene cunicularia hypugaea*	western burrowing owl			N	G4T4	S2	Y	Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows
Birds	*Vireo atricapilla*	black-capped vireo			N	G5	S3B	Y	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer.
Birds	*Aquila chrysaetos*	golden eagle			N	G5	S3B	Y	Golden eagles are resident in Texas and breed from early February to November, based on egg dates from February 16 to October 11. Winter visitors are present from late August to late April, most in Texas from early October to mid-March.
Birds	*Calcarius ornatus*	chestnut-collared longspur			N	G5	S3	Y	Occurs in open shortgrass settings especially in patches with some bare ground. Also occurs in grain sorghum

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
									fields and Conservation Reserve Program lands.
Birds	*Anthus spragueii*	Sprague's pipit			N	G3G4	S3N	Y	The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat during migration and in winter consists of pastures and weedy fields, including grasslands with dense herbaceous vegetation or grassy agricultural fields.
Birds	*Calamospiza melanocorys*	lark bunting			N	G5	S4B	Y	Overall, it is a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Shortgrasses include sideoats and blue gramas.
Insects	*Bombus pensylvanicus*	American bumblebee				G3G4	SNR	Y	Inhibit a variety of habitats, but found often on farmlands and in open fields, where they nest below the grass or underground.
Mammals	*Myotis velifer*	cave myotis bat			N	G4G5	S4	Y	Colonial and cave dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned cliff swallow (*Hirundo pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of the Edwards Plateau and gypsum caves of the Panhandle during winter; opportunistic insectivore.

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Mammals	*Perimyotis subflavus*	tricolored bat			N	G3G4	S3	Y	Forest, woodland and riparian areas are important. Caves are very important to this species.
Mammals	*Lasiurus borealis*	eastern red bat			N	G3G4	S4	Y	Red bats are migratory bats that are common across Texas. They are most common in the eastern and central parts of the state, due to their requirement of forests for foliage roosting. West Texas specimens are associated with forested areas (cottonwoods). They are also common along the coastline. These bats are highly mobile, seasonally migratory, and practice a type of "wandering migration." Associations with specific habitat is difficult unless specific migratory stopover sites or wintering grounds are found. Likely associated with any forested area in the east.
Mammals	*Lasiurus cinereus*	hoary bat			N	G3G4	S4	Y	Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas.
Mammals	*Cynomys ludovicianus*	black-tailed prairie dog			N	G4	S3	Y	Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups.
Mammals	*Mustela frenata*	long-tailed weasel			N	G5	S5	Y	Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges and rocky

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
									desert scrub. Usually live close to water.
Mammals	*Spilogale putorius*	eastern spotted skunk			N	G4	S1S3	Y	Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges, and woodlands. Prefer wooded, brushy areas, tallgrass prairies.
Mammals	*Spilogale gracilis*	western spotted skunk			N	G5	S5	Y	Brushy canyons, rocky outcrops (rimrock) on hillsides and walls of canyons. In semi-arid brushlands in the United States., in wet tropical forests in Mexico. When inactive or bearing young, occupies den in rocks, burrow.
Mammals	*Conepatus leuconotus*	western hog-nosed skunk			N	G4	S4	Y	Habitats include woodlands, grasslands, and deserts, to 7,200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. Telmalestes.
Mammals	*Puma concolor*	mountain lion			N	G5	S2S3	Y	Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains and riparian zones.
Mammals	*Antilocapra americana*	pronghorn			N	G5	S3	Y	Prefers hilly and plateau areas of open grassland, desert-grassland, and desert-scrub, where it frequents south-facing slopes and other sheltered areas.
Plants	*Vitis rupestris*	rock grape			N	G3	S1	Y	Occurs on rocky limestone slopes and in streambeds; perennial; flowering March–May; fruiting May-July.

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Plants	*Hexalectris nitida*	Glass Mountains coral-root			N	G2G3	S3	Y	Apparently rare in mixed woodlands in canyons in the mountains of Brewster County, but encountered with regularity, albeit in small numbers, under *Juniperus ashei* in woodlands over limestone on the Edwards Plateau, Callahan Divide, and Lampasas Cut Plain; perennial; flowering June-September; fruiting July-September.
Plants	*Hexalectris warnockii*	Warnock's coral-root			N	G3G4	S1	Y	In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creek beds in canyons; the Edwards Plateau in oak-juniper woodlands on limestone slopes; flowering June-September; individual plants do not usually bloom in successive years.
Plants	*Oenothera coryi*	Cory's evening-primrose			N	G3	S3	Y	Calcareous prairies in the Plains Country of north Texas and in the Panhandle; perennial; flowering April-May.
Plants	*Gaura triangulata*	prairie butterfly-weed			N	G3G4	S3	Y	Open sandy areas; annual; flowering March-June.
Reptiles	*Crotalus horridus*	timber (canebrake) rattlesnake			N	G4	S4	Y	Terrestrial: swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil, or black clay. Prefers dense ground cover (i.e., grapevines, palmetto).

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Reptiles	*Crotalus viridis*	western rattlesnake			N	G5	S5	Y	Terrestrial: dry desert and prairie grasslands, shrub desert rocky hillsides; edges of arid and semi-arid river breaks.
Reptiles	*Thamnophis sirtalis annectens*	Texas garter snake			N	G5T4	S1	Y	Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams, or marshes. Damp soils and debris for cover are thought to be critical.
Reptiles	*Heterodon nasicus*	western hognose snake			N	G5	S4	Y	Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub-encroached grasslands.
Reptiles	*Terrapene ornata*	western box turtle			N	G5	S3	Y	Terrestrial: Ornate or western box turtles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) or enter burrows made by other species.
Reptiles	*Phrynosoma cornutum*	Texas horned lizard			N	G4G5	S3	Y	Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6,000 feet, but

Table D-1. Taylor County, Texas – Rare, Threatened, and Endangered Species

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
									largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

(TPWD, 2023)

Key:

ESA = Species listed by the U.S. Fish and Wildlife Service under the Endangered Species Act
SPROT = State Protected, Rare, or Threatened Species (species listed by the State of Texas)
SCGN = Species of Greatest Conservation Need
Y = yes; N = No
P = Potentially Threatened
T = Threatened
G = Global rank indicator, based on worldwide distribution at the species level*
S = State rank indicator, based on distribution within Texas at the lowest taxonomic level
G1-Critically Imperiled — At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.
G2-Imperiled — At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3-Vulnerable — At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4-Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5-Secure — Common; widespread and abundant.
(State Rank)B-Breeding — Conservation status refers to the breeding population of the species in the nation or state/province.
(State Rank)N-Nonbreeding — Conservation status refers to the non-breeding population of the species in the nation or state/province.
S1-Critically Imperiled — Critically imperiled in the nation or state/province because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2-Imperiled — Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3-Vulnerable — Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4-Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5-Secure — Common, widespread, and abundant in the nation or state/province.
SNR-Unranked — Nation or state/province conservation status not yet assessed.
SU-Unrankable — Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
* Global and State ranking definitions as provided in the *Texas Conservation Action Plan 2011*: Status and Rank Key for use with SGCN and Rare Communities List

D.1.2 Whiteman Air Force Base

D.1.2.1 U.S. Fish and Wildlife List of Threatened and Endangered Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To: January 25, 2023
Project Code: 2023-0038069
Project Name: B-21 MOB 2 Beddown EIS

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).
New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region S7 Technical Assistance website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects:

projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features – particularly within stream corridors, riparian areas, or associated upland woodlots –gray bats could be affected.
Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches diameter at breast height (dbh) for Indiana bat, and ≥3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.
Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
- Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of "There are no listed species found within the vicinity of the project," then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.

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2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see #3 below) – then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species through the S7 Technical Assistance website.
3. If IPac returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:
   a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
   b. Any activity in or near the entrance to a cave or mine;
   c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
   d. Construction of one or more wind turbines; or
   e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the Range-wide Indiana Bat Summer Survey Guidelines.

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA

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to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

John Weber

Attachment(s):

- Official Species List

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Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
(573) 234-2132

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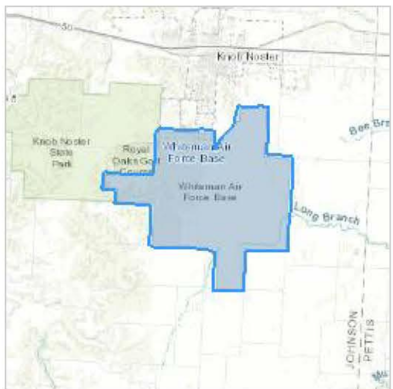
Project Summary

Project Code: 2023-0038069
Project Name: B-21 MOB 2 Beddown EIS
Project Type: Military Development
Project Description: The beddown of the B-21 Raider will take place through a series of three Main Operating Bases (MOB), referred to as MOB 1, MOB 2, and MOB 3. This MOB 2 EIS will evaluate the environmental impacts associated with beddowns at two candidate basing locations: (1) Dyess AFB, Texas; and (2) Whiteman AFB, Missouri.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.727353699999995,-93.56137278293812,14z



Counties: Johnson County, Missouri

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/SAHV6UYWX5CSLKWSEOI2FPRR6E/documents/generated/6868.pdf	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 General project design guidelines: https://ipac.ecosphere.fws.gov/project/SAHV6UYWX5CSLKWSEOI2FPRR6E/documents/generated/6868.pdf	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

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Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: Air Force
Name: Sarah Bresnan Rauch
Address: 13397 Lakefront Drive, Suite 100
City: Earth City
State: MO
Zip: 63045
Email sarah.e.bresnan@leidos.com
Phone: 3144439111

D.1.2.2 Missouri Department of Conservation – Natural Heritage Review Level Two Report: State Listed Endangered Species and/or Missouri Species/Natural Communities of Conservation Concern

Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

Natural Heritage Review Level Two Report: State Listed Endangered Species and/or Missouri Species/Natural Communities of Conservation Concern

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this report is to provide information to federal, state and local agencies, organizations, municipalities, corporations, and consultants regarding sensitive fish, wildlife, plants, natural communities, and habitats to assist in planning, designing, and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: B-21 MOB 2 PDEIS #12489
Project Description: The beddown of the B-21 Raider will take place through a series of three Main Operating Bases (MOB), referred to as MOB 1, MOB 2, and MOB 3. This MOB 2 EIS will evaluate the environmental impacts associated with beddowns at two candidate basing locations: (1) Dyess AFB, Texas; and (2) Whiteman AFB, MO.
Project Type: Residential, Commercial and Governmental Building Development
Contact Person: Sarah Rauch
Contact Information: sarah.e.bresnan@leidos.com or 3144439111

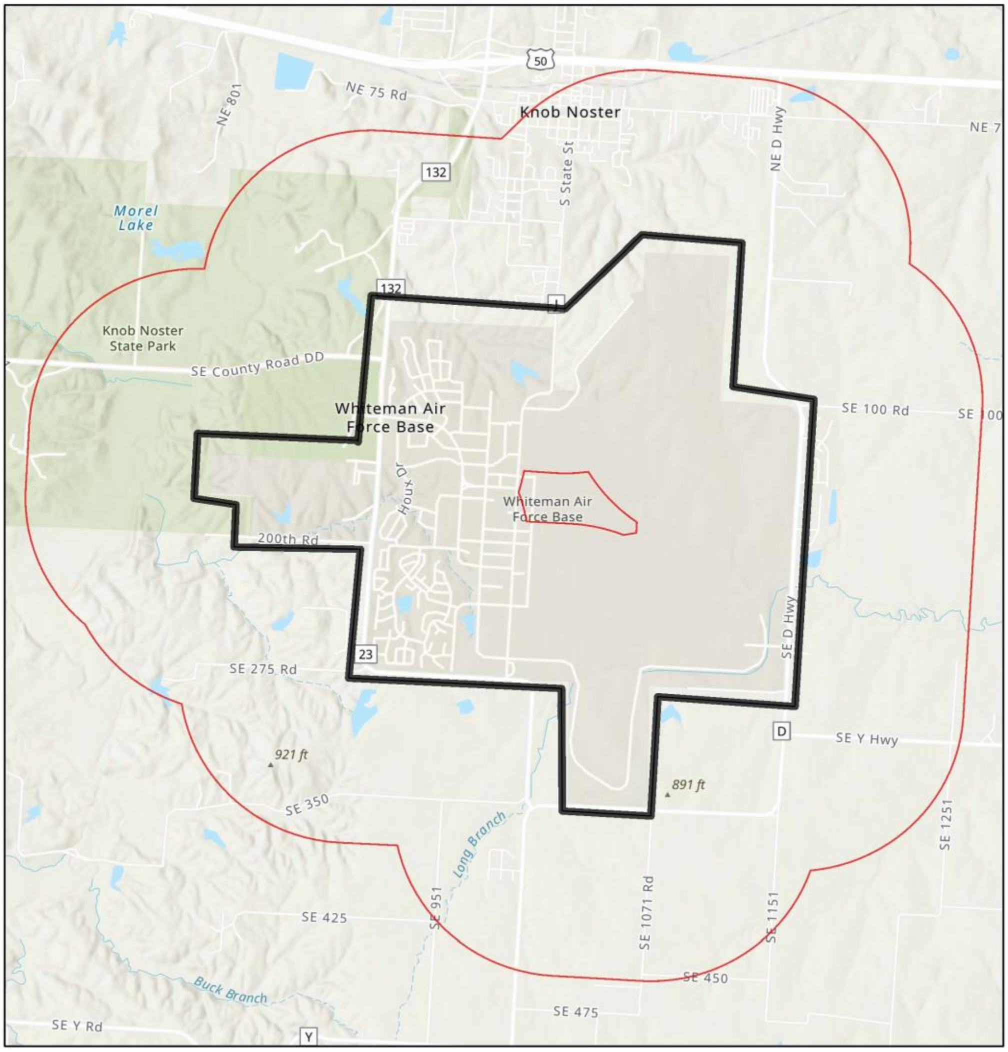
Disclaimer: This NATURAL HERITAGE REVIEW REPORT identifies if a species or natural community tracked by the Natural Heritage Program is known to occur within or near the project area submitted, and shares recommendations to avoid or minimize project impacts to sensitive species or natural habitats. Incorporating information from the Natural Heritage Program into project plans is an important step in reducing impacts to Missouri's sensitive natural resources. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information.

This Natural Heritage Review Report is not a site clearance letter for the project. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. Because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. This report does not fulfill Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit IPaC: Home (fws.gov) to initiate USFWS Information for Planning and Conservation (IPaC) consultation. Contact the Columbia Missouri Ecological Field Services Office (573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203) for more information.

Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit Home Page | Missouri Department of Transportation (modot.org) for additional information on recommendations.

B-21 MOB 2 PDEIS



March 31, 2023

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Buffered Project Boundary

Project Boundary

Esri, NASA, NGA, USGS, Missouri Dept. of Conservation, Missouri DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Missouri Department of Conservation | Page 3 of 6 | Report Created: 3/31/2023 04:35:17 PM

Species or Communities of Conservation Concern within the Area:

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

Other Special Search Results:

The project occurs on or near public land, Knob Noster State Park, Whiteman AFB, please contact DNR, US Milita*.

Your project is near a designated Natural Area . Please contact Missouri Department of Conservation (NaturalHeritageReview@mdc.mo.gov) for further coordination.

Project Type Recommendations:
New construction, maintenance and remodeling, including government, commercial and residential buildings and other structures. Fish, forest, and wildlife impacts can be avoided by siting projects in locations that have already been disturbed or previously developed, where and when feasible, and by avoiding alteration of areas providing existing habitat, such as wetlands, streams, forest, native grassland, etc. The project should be managed to minimize erosion and sedimentation/runoff to nearby wetlands, streams and lakes, including adherence to any Clean Water Act permit conditions. Project design should include storm water management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate areas in which the natural cover is disturbed to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza. Pollutants, including sediment, can have significant impacts far downstream. Use silt fences and/or vegetative filter strips to buffer streams and drainages, and monitor the site after rain events and until a well-rooted ground cover is reestablished. Please see Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100 for Ecological Services) for further coordination under the Endangered Species Act. Indiana bats *(Myotis sodalis,* federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis,* federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April.

Karst: This county has known karst geologic features (e.g., caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are Species of Conservation Concern) are influenced by changes to water quality; please check your project site for any karst features and make every effort to protect groundwater in the project area. Additional information and specific recommendations are available at Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov).

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See Managing Invasive Species in Your Community | Missouri Department of Conservation (mo.gov) for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (Kansas City District Regulatory Branch (army.mil)) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (Section 401 Water Quality Certification | Missouri Department of Natural Resources (mo.gov)), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit Wastewater Permits | Missouri Department of Natural Resources (mo.gov) for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

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Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 10). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 10-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See Missouri Species and Communities of Conservation Concern Checklist (mo.gov) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at Mofwis Search Results. Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

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D.2 USFWS SECTION 7 CONSULTATION

D.2.1 Dyess Air Force Base

D.2.1.1 USFWS, Austin Ecological Services Field Office (Texas)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

June 2, 2023

David E. Laurence, P.G.
Environmental Element Chief
7 CES/CEIE
710 Third Street
Dyess AFB
Abilene TX 79607

Christina Williams, Division Supervisor
USFWS, Austin Ecological Services Field Office
10711 Burnet Road, Suite #200
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Dear Ms. Williams

The Department of Defense (DoD) is developing a new bomber aircraft, the B-21 "Raider," which will eventually replace existing B-1 and B-2 bomber aircraft. The beddown of the B-21 will take place through a series of beddowns at three Main Operating Bases (MOBs), referred to as MOB 1, MOB 2, and MOB 3. The Department of the Air Force (DAF) previously chose Ellsworth AFB for MOB 1 in a Record of Decision signed in June 2021 (DAF, 2021). The DAF is now preparing an additional Environmental Impact Statement (EIS) to evaluate the potential environmental consequences associated with establishing the second beddown, MOB 2, at the remaining two alternative bases: Dyess AFB or Whiteman AFB.

The MOB 2 EIS evaluates the impacts from the Proposed Action on the current USFWS trust resources (defined as: threatened, endangered, proposed, and candidate species; proposed and final designated critical habitat; migratory birds; and wetlands) with the potential to occur within the region of influence (ROI). Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the DAF has determined that the B-21 MOB 2 beddown at Dyess AFB will have *no effect* on federally listed species. Rationales for these effects determinations for federally listed and proposed listed species are described herein.

Proposed Action

The EIS considers two alternative locations for the MOB 2 beddown of the B-21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities associated with the B-21 would occur. The Proposed Action includes the following activities:

- Facilities and infrastructure projects associated with establishing the B-21 Operations Squadrons, Weapons Instructor Course, and Operational Test and Evaluation
- Construction of a Weapons Generation Facility (WGF)
- Airfield operations

DEATH FROM ABOVE

- Airspace and range utilization, and
- Increasing numbers of personnel to support and conduct B-21 aircraft operations.

The ROI for biological resources for beddown actions at Dyess AFB occurs within the installation boundaries, specifically areas that encompass the construction footprints for proposed facilities and infrastructure projects and construction of the WGF (Attachment 1). The analysis also considers noise and bird–aircraft collisions associated with B-21 airfield operations on the base.

For B-21 airspace and range utilization, the ROI for biological resources includes the lands under the airspace and associated range boundaries. For Dyess AFB, military aircraft will utilize the Lancer, Lancer Bridge, Bronco (3 and 4), Brownwood, and Pecos Military Operating Areas (MOA), including all associated Air Traffic Control Assigned Airspaces (ATCAA), as well as the Willie-Roscoe ATCAA (Attachment 2). There are no plans to modify any of the airspace as a result of the Proposed Action. Since no ground disturbance would occur under the airspace during B-21 aircraft operations, terrestrial and aquatic vegetation, amphibians, reptiles, fish, and macroinvertebrates were excluded from further analysis. Additionally, wildlife habitat areas are not considered further since there would not be direct or indirect impacts from aircraft operations in the airspace. Therefore, the analysis for potential impacts to biological resources from airspace and range utilization only applies to mammalian and avian wildlife species known to occur in these areas and that have the potential to be impacted by noise and bird–aircraft collisions associated with B-21 aircraft operations.

Threatened, Endangered, and Candidate Species and Critical Habitat

The Dyess AFB Integrated Natural Resource Management Plan (INRMP) (Dyess AFB, 2022) and the USFWS Information for Planning and Consultation (IPaC) online system (USFWS, 2023a) were reviewed to determine if any federally listed, proposed, or candidate species, or their habitats, could potentially occur within the ROI. The IPaC Report generated an *Official Species List* of species protected under Section 7(c) of the ESA that could occur within the ROI (Project Code: 2023-0038002) (Attachment 3) (USFWS, 2023a).

Federally listed species with potential to occur under the Dyess AFB airspace units are listed in Attachment 4, which is based on an IPaC query for this project (USFWS, 2023b). Federally designated critical habitats were also evaluated. GIS data queries verified that there are federally designated critical habitats under the Lancer, Lancer Bridge, Brownwood, and Pecos MOAs airspace. Federally designated critical habitat for two fish species, the endangered smalleye shiner (*Notropis buccula*) and sharpnose shiner (*Notropis oxyrhynchus*) occurs under the Lancer airspace. Federally designated critical habitat for two proposed endangered clam species, Texas fatmucket (*Lampsilis bracteata*) and Texas pimpleback (*Quadrula petrina*), occurs under the Brownwood airspace. Federally designated critical habitat for one fish, the threatened Pecos bluntnose shiner (*Notropis simus pecosensis*), is present under the Pecos MOA airspace.

Effects Determinations

FACILITIES AND INFRASTRUCTURE

No federally listed plant or animal species are known to occur on Dyess AFB (Laurence, 2023; Dyess AFB, 2022). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a). As such, there would be *no effect* on the six federally listed/proposed for

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listing species presented in Attachment 3 or critical habitats from the facilities and infrastructure projects proposed under the Dyess AFB Alternative.

Weapons Generation Facility

There would be no impacts to federally listed species or designated critical habitat from activities associated with construction of the WGF because none occur in the Dyess AFB ROI. Constructing the WGF at Dyess AFB would have *no effect* on the five federally listed species presented in Attachment 3.

Airfield Operations

No federally listed plant or animal species are known to occur on Dyess AFB (Dyess AFB, 2022; Laurence, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a). There is a potential for piping plover and red knot to occur during seasonal migrations, but these species have not been observed or documented on the base (Dyess AFB, 2022; Laurence, 2023). Under the Dyess AFB Alternative, airfield operations would decrease from the baseline conditions at Dyess AFB by approximately 4.2 percent. Additionally, noise levels at Dyess AFB would decrease from the baseline conditions. Therefore, the noise in the area and the number of acres and wildlife exposed from B-21 operations would decrease overall as a result of establishing the B-21 MOB 2 beddown at Dyess AFB. Based on the absence of federally listed species and habitats on base and the decrease in operations at Dyess AFB, there would be *no effect* to ESA-listed species or critical habitats from airfield operations under the Dyess AFB Alternative.

Airspace and Range Utilization

Under the Dyess AFB Alternative, overall aircraft operations would decrease from baseline conditions at the Bronco MOA (by approximately 7.66 percent), the Willie-Roscoe ATCAA (by approximately 66.47 percent), the Brownwood MOA (by approximately 0.45 percent), the Lancer MOA (by approximately 23.20 percent), the Lancer Bridge MOA (by approximately 39.71 percent), and the Pecos MOA (by approximately 19.68 percent). A reduction in aircraft operations throughout the training airspace would likely decrease the potential for bird–aircraft strike encounters or, at a minimum, pose no additional strike risks in these areas.

Resulting noise levels from B-21 aircraft operations beneath the training airspace would remain the same for Lancer Bridge MOA and Bronco MOA (less than 35 A-weighted decibels [dBA] onset-rate adjusted monthly day-night average sound level [L_{dnmr}]) or would decrease by 15 dBA L_{dnmr}, 3.9 dBA L_{dnmr}, 3.4 dBA L_{dnmr}, and 0.5 dBA L_{dnmr} for Pecos MOA, Willie-Roscoe ATCAA, Lancer MOA, and Brownwood MOA, respectively. The noise in the area and the number of acres and wildlife exposed would decrease overall from establishing the B-21 MOB 2 beddown at Dyess AFB. Therefore, under the Dyess AFB Alternative, there would be a reduced potential for adverse noise effects to noise sensitive wildlife (including special status species) within training airspace and ranges from B-21 operations.

Since there would be no ground disturbance under the airspace and direct impacts to habitat areas would not occur, the DAF determines there would be *no effect* to smalleye shiner critical habitat, sharpnose shiner critical habitat, Texas fatmucket critical habitat, Texas pimpleback critical habitat, and Pecos bluntnose shiner critical habitat. Additionally, based on the reduced potential for noise effects and strike potential to avian and mammalian species from B-21 operations, the DAF determines that airspace and range utilization under the Dyess AFB Alternative would have *no effect* on federally listed species identified in Attachment 4.

PERSONNEL

The B-21 MOB 2 mission would require an increase in personnel to execute the proposed mission. However, impacts to federally listed or proposed listed species would not occur from this action. No federally listed plant or animal species are known to occur on Dyess AFB (Dyess AFB, 2022; Laurence, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a).

Conclusion

In accordance with Section 7 of the ESA (16 U.S.C. §§ 1531–1544, as amended), the DAF determines that the B-21 MOB 2 beddown at Dyess AFB would have *no effect* to ESA listed species and designated critical habitat. If there is a change in the Proposed Action that would modify this determination, the DAF would initiate consultation with your office, as appropriate. If you have any questions or concerns, please contact David E. Laurence, P.G. Environmental Element Chief, at david.laurence@us.af.mil or (325) 696-5664. Thank you for your time.

Sincerely

David E. Laurence, 7 CES/CEIE, DAF
Environmental Element Chief

Attachments:

1. Map of Facilities, Infrastructure, and WGF Construction Footprint at Dyess AFB
2. Airspace and Range Utilization for Dyess AFB
3. Federally Listed Species with the Potential to Occur at Dyess AFB
4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

References:

Cox. (2023, May 24). Personal communication between Conner Cox, USFWS (Natural Resource Program Manager, Dyess AFB) and Sarah Rauch (Senior Ecologist, Leidos). RE: Observations of Special Status Species at Dyess AFB. .

DAF. (2021). *B-21 Main Operating Base 1 (MOB 1) Beddown at Dyess AFB, Texas or Ellsworth AFB, South Dakota Final Environmental Impact Statement.*

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TPWD. (n.d.). *Tricolored Bat (Perimyotis subflavus).* Retrieved from Texas Parks and Wildlife Department: https://tpwd.texas.gov/huntwild/wild/species/easpip/#:~:text=They%20can%20be%20found%20in,recent%20record%20from%20Lubbock%20County.&text=Like%20other%20cave%2Ddwelling%20species,killed%20in%20its%20hibernation%20caves.

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USFWS. (2023b). *Information for Planning and Consultation: IPaC Resource Lists (for counties under the airspace)*. Retrieved from U.S. Fish and Wildlife Service: https://www.fws.gov/ipac/.

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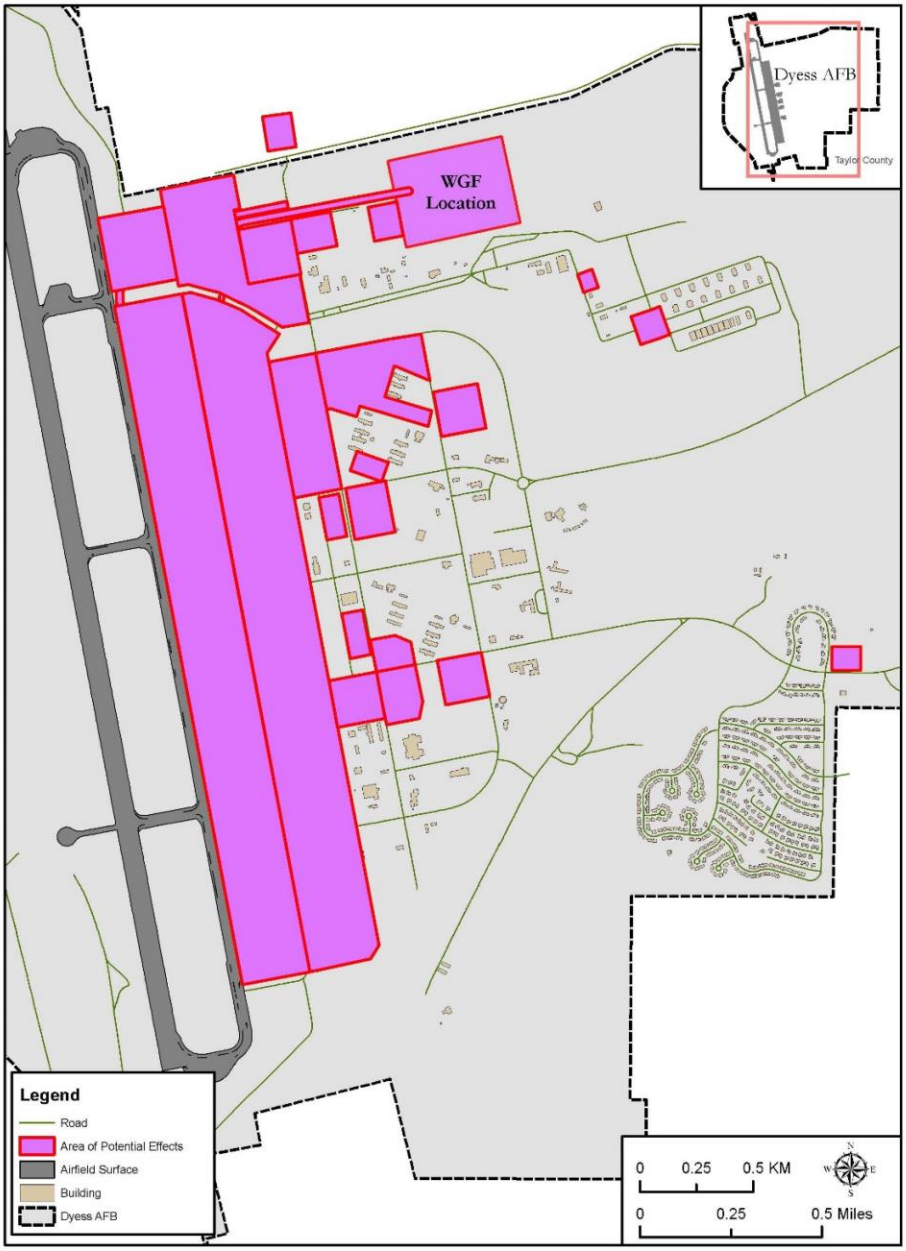
Attachment 1: Map of Facilities, Infrastructure, and WGF Construction Footprint at Dyess AFB



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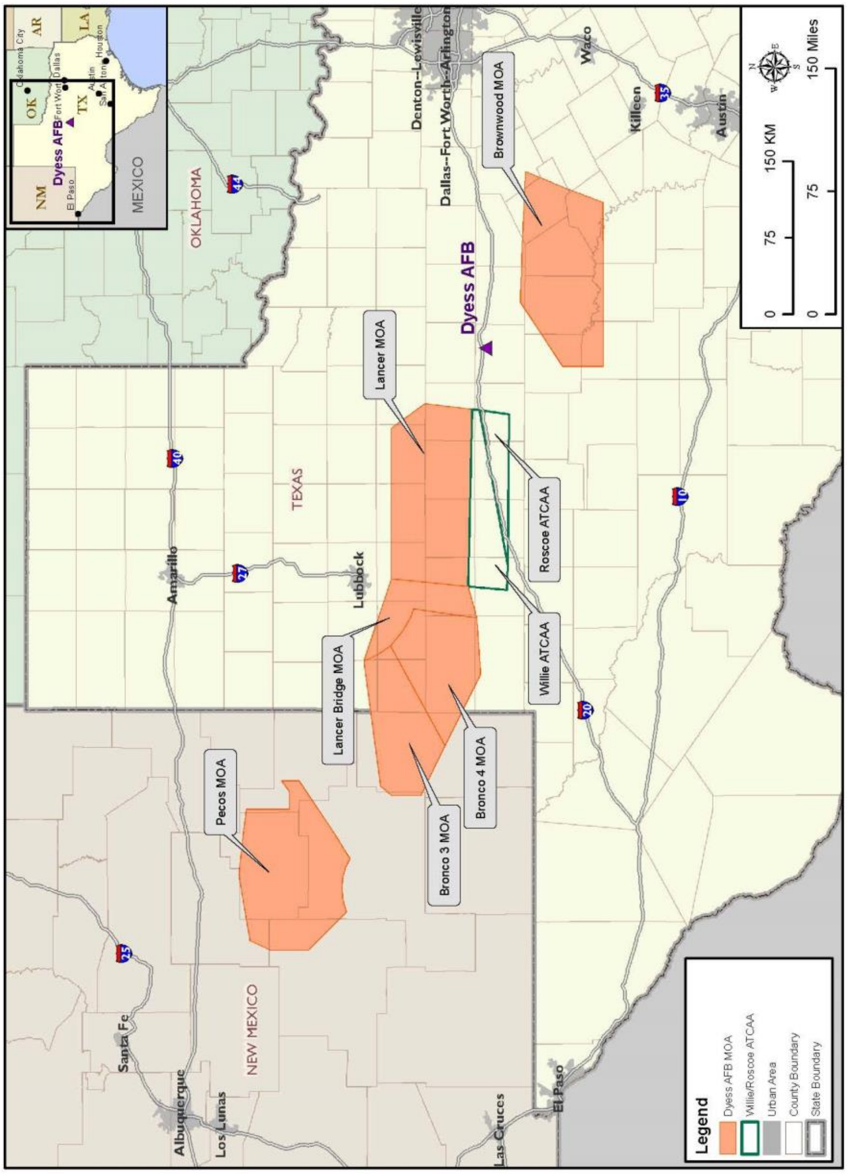
Attachment 2: Airspace and Range Utilization for Dyess AFB



Attachment 3. Federally Listed Species with the Potential to Occur at Dyess AFB

Common Name	Scientific Name	Protection Status	Potential for Occurrence at Dyess AFB
Mammals			
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Yes. Tricolored bats spend six to nine months per year hibernating in caves or mines but may also utilize some anthropogenic structures. Foraging habitat includes forest edges and over ponds and waterways for small insects. While this species has not been confirmed present at Dyess AFB, potential suitable roosting habitat occurs within installation hangers where other bat species have been observed. Acoustic monitoring is slated for the summer of 2023 to confirm presence or absence of this species; bat monitoring surveys were last conducted in 2017.
Fish			
Smalleye Shiner	*Notropis buccula*	Endangered	None. Suitable habitat not present. This species is endemic to Brazos River drainage.
Sharpnose Shiner	*Notropis oxyrhynchus*	Endangered	None. Suitable habitat not present. This species is endemic to Brazos River drainage.
Birds			
Piping Plover	*Charadrius melodus*	Threatened	Potential during migration. Habitat includes sandy beaches and lakeshores. Texas is the wintering home for 35 percent of the known population of piping plovers. Arrive in late July or early August and will remain for up to 9 months.
Red Knot	*Calidris canutus rufa*	Threatened	Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding occurs outside of the ROI in the central Canadian Arctic.
Insects			
Monarch Butterfly	*Danaus plexippus*	Candidate	Potential spring and winter migrant throughout the state. Monarchs migrate north to the United States and Canada in March from the mature oyamel fir forests in the mountains of central Mexico. The fall migration back to overwintering sites in Mexico is from August to November.

Source: (USFWS, 2023a; Dyess AFB, 2022; USFWS, 2019; USFWS, 2005; TPWD, n.d.; USFWS, 2023a; NatureServe, 2022; TPWD, n.d.; Cox, 2023)
Key: % = percent; AFB = Air Force Base; ROI = region of influence

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Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Birds					
Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	Endangered	Lancer Lancer Bridge Pecos Bronco	None	Yes. Species potential habitat includes the ROI. Prefers shortgrass prairies of the southern Great Plains.
Northern Alpomado Falcon	*Falco femoralis septentrionalis*	Endangered (Texas); Experimental Population, Non-Essential (New Mexico)	Lancer Lancer Bridge Pecos Bronco	None	Yes. Species potential habitat includes the ROI. Historical range included Arizona, New Mexico, Texas. Aplomado falcons inhabit desert grasslands and savannas of Latin America, and formerly inhabited desert grasslands and coastal prairies of Texas, New Mexico, and southeastern Arizona.
Piping Plover	*Charadrius melodus*	Threatened	Lancer Lancer Bridge Brownwood Pecos Bronco Willie-Roscoe	None	Yes. Potential during migration through Texas but unlikely through New Mexico. Piping plovers winter in Texas along the coast. Texas is the wintering home for 35% of the known population of piping plovers.
Red Knot	*Calidris canutus rufa*	Threatened	Lancer Lancer Bridge Brownwood Bronco Willie-Roscoe	None	Yes. Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding does not occur within the ROI in the central Canadian Arctic.
Whooping Crane	*Grus americana*	Endangered	Lancer Brownwood Willie-Roscoe	None	Yes. Potential during migration between Canada and the Texas coast. Whooping cranes utilize use a variety of habitats including sloughs, marshes, rivers, lakes, ponds, croplands, and pastures. Arrive on the Texas coast between late October and mid-December.
Golden-Cheeked Warbler	*Dendroica chrysoparia*	Endangered	Brownwood	None	Yes. Preferred habitat occurs within the ROI. Golden-cheeked warbler habitat includes woodlands with tall Ashe juniper, oaks, and other hardwood trees.
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Pecos	None	Unlikely. Species' historical range is outside of the ROI.

Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	Pecos	None	Yes. Potential spring and fall migrant. Breeding habitat does not occur within the ROI.
Yellow-Billed Cuckoo	*Coccyzus americanus*	Threatened	Pecos Bronco	None	Yes. Species' potential habitat includes the ROI. In New Mexico, the species is found in riparian zones with dense understory vegetation, most commonly in the south and along major drainages. In western Texas, the species is considered common and widespread throughout the state. Preferred habitat includes open woodlands with dense undergrowth, overgrown orchards and pastures, moist thickets, and willow groves along stream banks.
Mammals					
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Lancer Lancer Bridge Brownwood Bronco	None	Yes. Species' potential habitat includes the ROI. Found in a variety of terrestrial habitats, including grasslands, old fields, suburban areas, orchards, urban areas, and woodlands.
New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	Endangered	Pecos	None	Unlikely. ROI occurs outside of the species' current native distribution.
Penasco Least Chipmunk	*Tamias minimus atristriatus*	Proposed Endangered	Pecos	None	Unknown. The Penasco least chipmunk has a narrow range and small population size—only two known populations occur in the White and Sacramento Mountain ranges in Otero and Lincoln Counties in New Mexico.

Source: (DAF, 2021; Dyess, 2022; USFWS, 2023b)
Key: ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operating Area; ROI = region of influence; USFWS = U.S. Fish and Wildlife Service
Note:
The ROI for federally listed species under the airspace only applies to various bird and mammal species known to occur or with potential to occur in these areas and that have the potential to be impacted by noise associated with B-21 aircraft operations.

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D.2.1.2 USFWS, New Mexico Ecological Services Field Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

June 2, 2023

David E. Laurence, P.G.
Environmental Element Chief
7 CES/CEIE
710 Third Street
Dyess AFB
Abilene TX 79607

Shawn Sartorius, Field Supervisor
USFWS, New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque NM 87113

Dear Mr. Sartorius

The Department of Defense (DoD) is developing a new bomber aircraft, the B-21 “Raider,” which will eventually replace existing B-1 and B-2 bomber aircraft. The beddown of the B-21 will take place through a series of beddowns at three Main Operating Bases (MOBs), referred to as MOB 1, MOB 2, and MOB 3. The Department of the Air Force (DAF) previously chose Ellsworth AFB for MOB 1 in a Record of Decision signed in June 2021 (DAF, 2021). The DAF is now preparing an additional Environmental Impact Statement (EIS) to evaluate the potential environmental consequences associated with establishing the second beddown, MOB 2, at the remaining two alternative bases: Dyess AFB or Whiteman AFB.

The MOB 2 EIS evaluates the impacts from the Proposed Action on the current USFWS trust resources (defined as: threatened, endangered, proposed, and candidate species; proposed and final designated critical habitat; migratory birds; and wetlands) with the potential to occur within the region of influence (ROI). Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the DAF has determined that the B-21 MOB 2 beddown at Dyess AFB will have *no effect* on federally listed species. Rationales for these effects determinations for federally listed and proposed listed species are described herein.

Proposed Action

The EIS considers two alternative locations for the MOB 2 beddown of the B-21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities associated with the B-21 would occur. The Proposed Action includes the following activities:

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- Airfield operations

DEATH FROM ABOVE

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- Increasing numbers of personnel to support and conduct B-21 aircraft operations.

The ROI for biological resources for beddown actions at Dyess AFB occurs within the installation boundaries, specifically areas that encompass the construction footprints for proposed facilities and infrastructure projects and construction of the WGF (Attachment 1). The analysis also considers noise and bird–aircraft collisions associated with B-21 airfield operations on the base.

For B-21 airspace and range utilization, the ROI for biological resources includes the lands under the airspace and associated range boundaries. For Dyess AFB, military aircraft will utilize the Lancer, Lancer Bridge, Bronco (3 and 4), Brownwood, and Pecos Military Operating Areas (MOA), including all associated Air Traffic Control Assigned Airspaces (ATCAA), as well as the Willie-Roscoe ATCAA (Attachment 2). There are no plans to modify any of the airspace as a result of the Proposed Action. Since no ground disturbance would occur under the airspace during B-21 aircraft operations, terrestrial and aquatic vegetation, amphibians, reptiles, fish, and macroinvertebrates were excluded from further analysis. Additionally, wildlife habitat areas are not considered further since there would not be direct or indirect impacts from aircraft operations in the airspace. Therefore, the analysis for potential impacts to biological resources from airspace and range utilization only applies to mammalian and avian wildlife species known to occur in these areas and that have the potential to be impacted by noise and bird–aircraft collisions associated with B-21 aircraft operations.

Threatened, Endangered, and Candidate Species and Critical Habitat

The Dyess AFB Integrated Natural Resource Management Plan (INRMP) (Dyess AFB, 2022) and the USFWS Information for Planning and Consultation (IPaC) online system (USFWS, 2023a) were reviewed to determine if any federally listed, proposed, or candidate species, or their habitats, could potentially occur within the ROI. The IPaC Report generated an *Official Species List* of species protected under Section 7(c) of the ESA that could occur within the ROI (Project Code: 2023-0038002) (Attachment 3) (USFWS, 2023a).

Federally listed species with potential to occur under the Dyess AFB airspace units are listed in Attachment 4, which is based on an IPaC query for this project (USFWS, 2023b). Federally designated critical habitats were also evaluated. GIS data queries verified that there are federally designated critical habitats under the Lancer, Lancer Bridge, Brownwood, and Pecos MOAs airspace. Federally designated critical habitat for two fish species, the endangered smalleye shiner (*Notropis buccula*) and sharpnose shiner (*Notropis oxyrhynchus*) occurs under the Lancer airspace. Federally designated critical habitat for two proposed endangered clam species, Texas fatmucket (*Lampsilis bracteata*) and Texas pimpleback (*Quadrula petrina*), occurs under the Brownwood airspace. Federally designated critical habitat for one fish, the threatened Pecos bluntnose shiner (*Notropis simus pecosensis*), is present under the Pecos MOA airspace.

Effects Determinations

FACILITIES AND INFRASTRUCTURE

No federally listed plant or animal species are known to occur on Dyess AFB (Laurence, 2023; Dyess AFB, 2022). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a). As such, there would be *no effect* on the six federally listed/proposed for listing species presented in Attachment 3 or critical habitats from the facilities and infrastructure projects proposed under the Dyess AFB Alternative.

Weapons Generation Facility

There would be no impacts to federally listed species or designated critical habitat from activities associated with construction of the WGF because none occur in the Dyess AFB ROI. Constructing the WGF at Dyess AFB would have *no effect* on the five federally listed species presented in Attachment 3.

Airfield Operations

No federally listed plant or animal species are known to occur on Dyess AFB (Dyess AFB, 2022; Laurence, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a). There is a potential for piping plover and red knot to occur during seasonal migrations, but these species have not been observed or documented on the base (Dyess AFB, 2022; Laurence, 2023). Under the Dyess AFB Alternative, airfield operations would decrease from the baseline conditions at Dyess AFB by approximately 4.2 percent. Additionally, noise levels at Dyess AFB would decrease from the baseline conditions. Therefore, the noise in the area and the number of acres and wildlife exposed from B-21 operations would decrease overall as a result of establishing the B-21 MOB 2 beddown at Dyess AFB. Based on the absence of federally listed species and habitats on base and the decrease in operations at Dyess AFB, there would be *no effect* to ESA-listed species or critical habitats from airfield operations under the Dyess AFB Alternative.

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Since there would be no ground disturbance under the airspace and direct impacts to habitat areas would not occur, the DAF determines there would be *no effect* to smalleye shiner critical habitat, sharpnose shiner critical habitat, Texas fatmucket critical habitat, Texas pimpleback critical habitat, and Pecos bluntnose shiner critical habitat. Additionally, based on the reduced potential for noise effects and strike potential to avian and mammalian species from

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B-21 operations, the DAF determines that airspace and range utilization under the Dyess AFB Alternative would have *no effect* on federally listed species identified in Attachment 4.

PERSONNEL

The B-21 MOB 2 mission would require an increase in personnel to execute the proposed mission. However, impacts to federally listed or proposed listed species would not occur from this action. No federally listed plant or animal species are known to occur on Dyess AFB (Dyess AFB, 2022; Laurence, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023a).

Conclusion

In accordance with Section 7 of the ESA (16 U.S.C. §§ 1531–1544, as amended), the DAF determines that the B-21 MOB 2 beddown at Dyess AFB would have *no effect* to ESA listed species and designated critical habitat. If there is a change in the Proposed Action that would modify this determination, the DAF would initiate consultation with your office, as appropriate. If you have any questions or concerns, please contact David E. Laurence, P.G. Environmental Element Chief, at david.laurence@us.af.mil or (325) 696-5664. Thank you for your time.

Sincerely

David E. Laurence, 7 CES/CEIE, DAF
Environmental Element Chief

Attachments:
1. Map of Facilities, Infrastructure, and WGF Construction Footprint at Dyess AFB
2. Airspace and Range Utilization for Dyess AFB
3. Federally Listed Species with the Potential to Occur at Dyess AFB
4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

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USFWS. (2023a, January 25). *Official Species List*. Retrieved from U.S. Fish and Wildlife Service Information for Planning and Consultation: https://ecos.fws.gov/ipac/

USFWS. (2023b). *Information for Planning and Consultation: IPaC Resource Lists (for counties under the airspace)*. Retrieved from U.S. Fish and Wildlife Service: https://www.fws.gov/ipac/.

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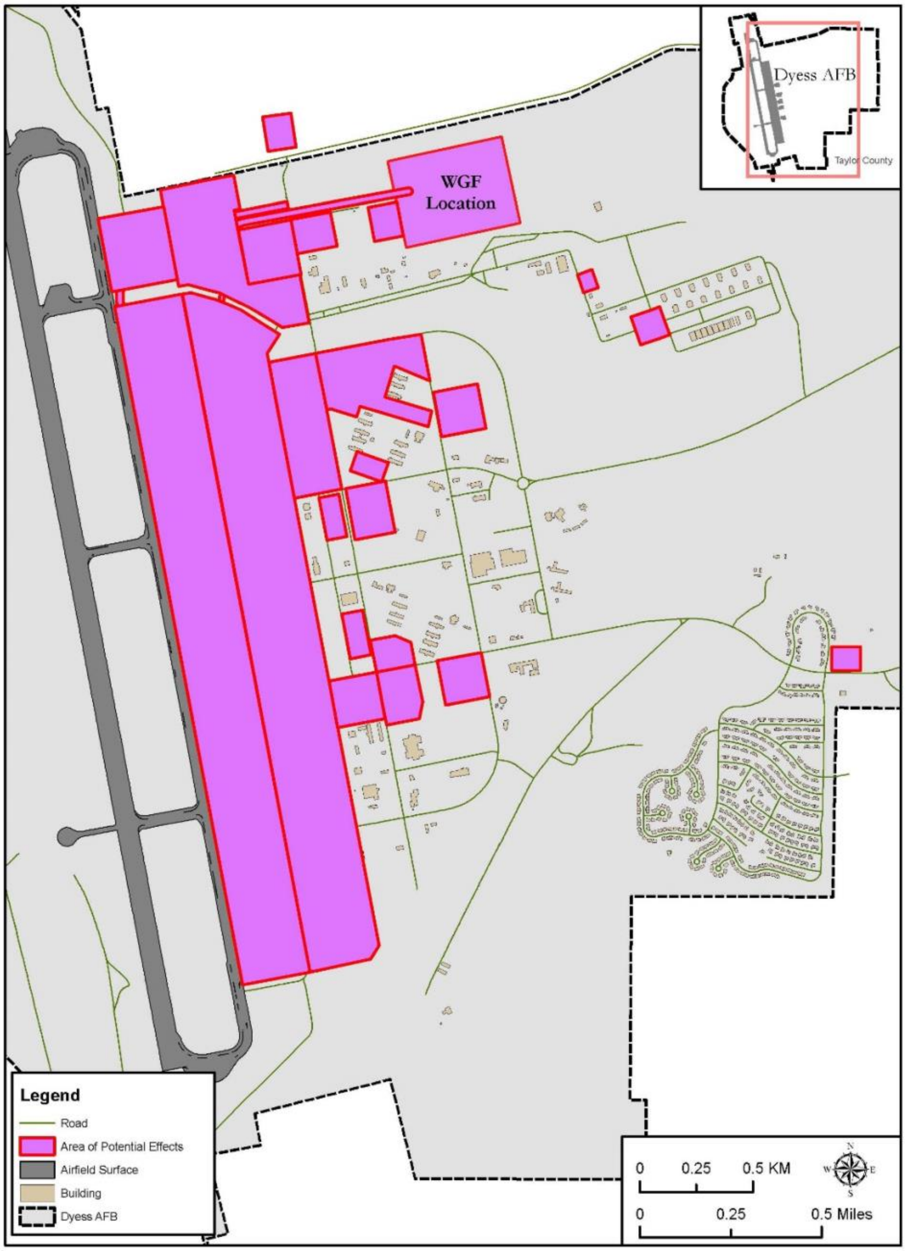
Attachment 1: Map of Facilities, Infrastructure, and WGF Construction Footprint at Dyess AFB



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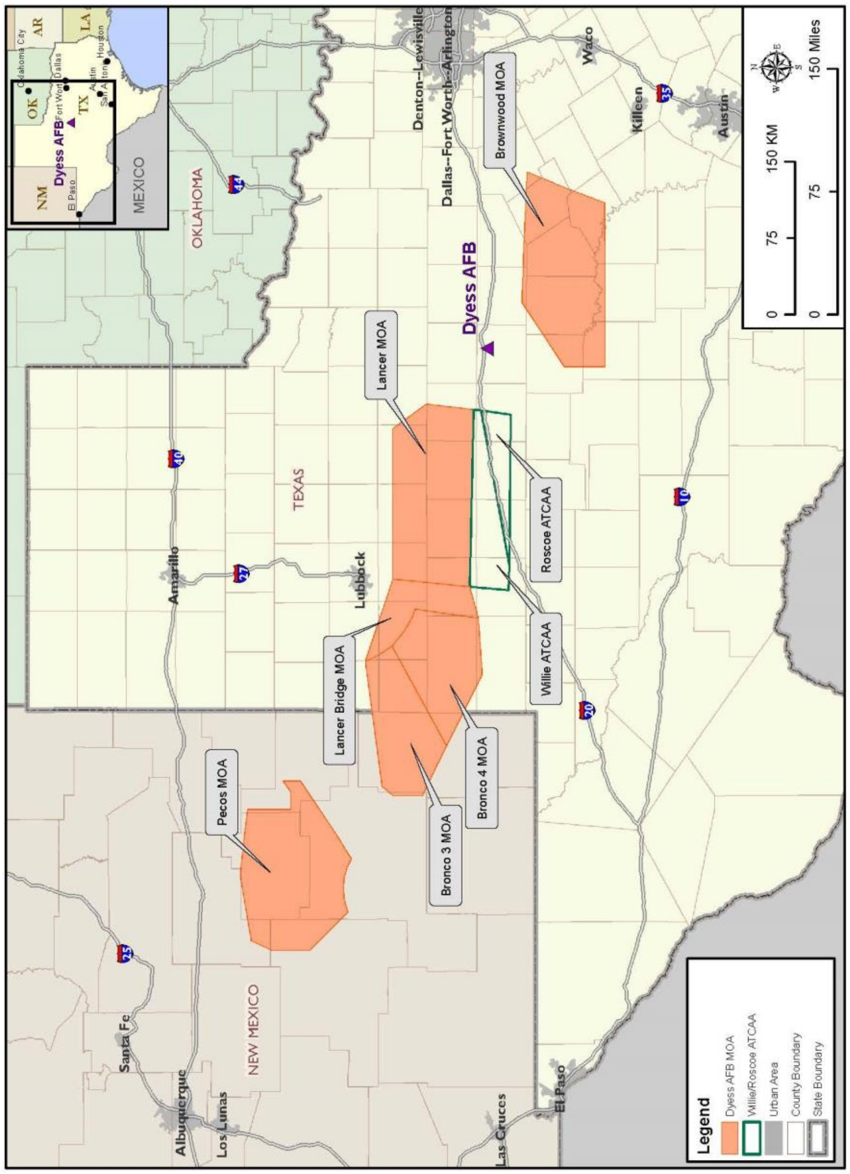
Attachment 2: Airspace and Range Utilization for Dyess AFB



Attachment 3: Federally Listed Species with the Potential to Occur at Dyess AFB

Common Name	Scientific Name	Protection Status	Potential for Occurrence at Dyess AFB
Mammals			
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Yes. Tricolored bats spend six to nine months per year hibernating in caves or mines but may also utilize some anthropogenic structures. Foraging habitat includes forest edges and over ponds and waterways for small insects. While this species has not been confirmed present at Dyess AFB, potential suitable roosting habitat occurs within installation hangers where other bat species have been observed. Acoustic monitoring is slated for the summer of 2023 to confirm presence or absence of this species; bat monitoring surveys were last conducted in 2017.
Fish			
Smalleye Shiner	*Notropis buccula*	Endangered	None. Suitable habitat not present. This species is endemic to Brazos River drainage.
Sharpnose Shiner	*Notropis oxyrhynchus*	Endangered	None. Suitable habitat not present. This species is endemic to Brazos River drainage.
Birds			
Piping Plover	*Charadrius melodus*	Threatened	Potential during migration. Habitat includes sandy beaches and lakeshores. Texas is the wintering home for 35 percent of the known population of piping plovers. Arrive in late July or early August and will remain for up to 9 months.
Red Knot	*Calidris canutus rufa*	Threatened	Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding occurs outside of the ROI in the central Canadian Arctic.
Insects			
Monarch Butterfly	*Danaus plexippus*	Candidate	Potential spring and winter migrant throughout the state. Monarchs migrate north to the United States and Canada in March from the mature oyamel fir forests in the mountains of central Mexico. The fall migration back to overwintering sites in Mexico is from August to November.

Source: (USFWS, 2023a; Dyess AFB, 2022; USFWS, 2019; USFWS, 2005; TPWD, n.d.; USFWS, 2023a; NatureServe, 2022; TPWD, n.d.; Cox, 2023)
Key: % = percent; AFB = Air Force Base; ROI = region of influence

1

Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Birds					
Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	Endangered	Lancer Lancer Bridge Pecos Bronco	None	Yes. Species potential habitat includes the ROI. Prefers shortgrass prairies of the southern Great Plains.
Northern Alpomado Falcon	*Falco femoralis septentrionalis*	Endangered (Texas); Experimental Population, Non-Essential (New Mexico)	Lancer Lancer Bridge Pecos Bronco	None	Yes. Species potential habitat includes the ROI. Historical range included Arizona, New Mexico, Texas. Aplomado falcons inhabit desert grasslands and savannas of Latin America, and formerly inhabited desert grasslands and coastal prairies of Texas, New Mexico, and southeastern Arizona.
Piping Plover	*Charadrius melodus*	Threatened	Lancer Lancer Bridge Brownwood Pecos Bronco Willie-Roscoe	None	Yes. Potential during migration through Texas but unlikely through New Mexico. Piping plovers winter in Texas along the coast. Texas is the wintering home for 35% of the known population of piping plovers.
Red Knot	*Calidris canutus rufa*	Threatened	Lancer Lancer Bridge Brownwood Bronco Willie-Roscoe	None	Yes. Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding does not occur within the ROI in the central Canadian Arctic.
Whooping Crane	*Grus americana*	Endangered	Lancer Brownwood Willie-Roscoe	None	Yes. Potential during migration between Canada and the Texas coast. Whooping cranes utilize use a variety of habitats including sloughs, marshes, rivers, lakes, ponds, croplands, and pastures. Arrive on the Texas coast between late October and mid-December.
Golden-Cheeked Warbler	*Dendroica chrysoparia*	Endangered	Brownwood	None	Yes. Preferred habitat occurs within the ROI. Golden-cheeked warbler habitat includes woodlands with tall Ashe juniper, oaks, and other hardwood trees.
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Pecos	None	Unlikely. Species' historical range is outside of the ROI.

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Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	Pecos	None	Yes. Potential spring and fall migrant. Breeding habitat does not occur within the ROI.
Yellow-Billed Cuckoo	*Coccyzus americanus*	Threatened	Pecos Bronco	None	Yes. Species' potential habitat includes the ROI. In New Mexico, the species is found in riparian zones with dense understory vegetation, most commonly in the south and along major drainages. In western Texas, the species is considered common and widespread throughout the state. Preferred habitat includes open woodlands with dense undergrowth, overgrown orchards and pastures, moist thickets, and willow groves along stream banks.
Mammals					
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Lancer Lancer Bridge Brownwood Bronco	None	Yes. Species' potential habitat includes the ROI. Found in a variety of terrestrial habitats, including grasslands, old fields, suburban areas, orchards, urban areas, and woodlands.
New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	Endangered	Pecos	None	Unlikely. ROI occurs outside of the species' current native distribution.
Penasco Least Chipmunk	*Tamias minimus atristriatus*	Proposed Endangered	Pecos	None	Unknown. The Penasco least chipmunk has a narrow range and small population size—only two known populations occur in the White and Sacramento Mountain ranges in Otero and Lincoln Counties in New Mexico.

Source: (DAF, 2021; Dyess, 2022; USFWS, 2023b)
Key: ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operating Area; ROI = region of influence; USFWS = U.S. Fish and Wildlife Service
Note:
The ROI for federally listed species under the airspace only applies to various bird and mammal species known to occur or with potential to occur in these areas and that have the potential to be impacted by noise associated with B-21 aircraft operations.

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D.2.2 Whiteman Air Force Base

D.2.2.1 USFWS, Missouri Ecological Services Field Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

June 2, 2023

Keith Donaldson
Biological Scientist
509 CES/CEIEC
Whiteman AFB MO 65305

Trisha Crabill, Threatened and Endangered Species Coordinator
USFWS, Missouri Ecological Services Field Office
101 Park Deville Drive, Suite A
Columbia MO 65203

Dear Ms. Crabill

The Department of Defense (DoD) is developing a new bomber aircraft, the B-21 "Raider," which will eventually replace existing B-1 and B-2 bomber aircraft. The beddown of the B-21 will take place through a series of beddowns at three Main Operating Bases (MOBs), referred to as MOB 1, MOB 2, and MOB 3. The Department of the Air Force (DAF) previously chose Ellsworth AFB for MOB 1 in a Record of Decision signed in June 2021 (DAF, 2021). The DAF is now preparing an additional Environmental Impact Statement (EIS) to evaluate the potential environmental consequences associated with establishing the second beddown, MOB 2, at the remaining two alternative bases: Dyess AFB or Whiteman AFB.

The MOB 2 EIS evaluates the impacts from the Proposed Action on the current USFWS trust resources (defined as: threatened, endangered, proposed, and candidate species; proposed and final designated critical habitat; migratory birds; and wetlands) with the potential to occur within the region of influence (ROI). Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the DAF has determined that the B-21 MOB 2 beddown at Whiteman AFB will have *no effect* on federally listed species. Rationales for these effects determinations for federally listed and proposed listed species are described herein.

Proposed Action

The EIS considers two alternative locations for the MOB 2 beddown of the B-21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities associated with the B-21 would occur. The Proposed Action includes the following activities:

- Facilities and infrastructure projects associated with establishing the B-21 Operations Squadrons, Weapons Instructor Course, and Operational Test and Evaluation
- Construction of a Weapons Generation Facility (WGF), including two Subalternatives:
  - The North WGF Site
  - The South WGF Site
- Airfield operations

DEFEND...AVENGE!

- Airspace and range utilization; and
- Increasing numbers of personnel to support and conduct B-21 aircraft operations.

The ROI for biological resources for beddown actions at Whiteman AFB occurs within the installation boundaries, specifically areas that encompass the construction footprints for proposed facilities and infrastructure projects and construction of the WGF (Attachment 1). The analysis also considers noise and bird–aircraft collisions associated with B-21 airfield operations on the base.

For B-21 airspace and range utilization, the ROI for biological resources includes the lands under the airspace and associated range boundaries. For Whiteman AFB, military aircraft will utilize the Smoky Hill Range (Smoky MOA, Bison MOA, and R-3601A/B), the Ada (East and West), Lindbergh (A, B, C), Cannon, and Truman (A, B, C) MOAs, including all associated ATCAAs, as well as the Ozark ATCAA (A, B, C) (Attachment 2). There are no plans to modify any of the airspace as a result of the Proposed Action. Since no ground disturbance would occur under the airspace during B-21 aircraft operations, terrestrial and aquatic vegetation, amphibians, reptiles, fish, and macroinvertebrates were excluded from further analysis. Additionally, wildlife habitat areas are not considered further since there would not be direct or indirect impacts from aircraft operations in the airspace. Therefore, the analysis for potential impacts to biological resources from airspace and range utilization only applies to mammalian and avian wildlife species known to occur in these areas and that have the potential to be impacted by noise and bird–aircraft collisions associated with B-21 aircraft operations.

Threatened, Endangered, and Candidate Species and Critical Habitat

The Whiteman AFB Integrated Natural Resource Management Plan (INRMP) (Whiteman AFB, 2022) and the USFWS Information for Planning and Consultation (IPaC) online system (USFWS, 2023) were reviewed to determine if any federally listed, proposed, or candidate species, or their habitats, could potentially occur within the ROI. The IPaC Report generated an *Official Species List* of species protected under Section 7(c) of the ESA that could occur within the ROI (Project Code: 2023-0038069) (Attachment 3) (USFWS, 2023).

Federally listed species with potential to occur under the Whiteman AFB airspace units are listed in Attachment 4, which is based on an IPaC query for this project (USFWS, 2023). Federally designated critical habitats were also evaluated. GIS data queries verified that there are federally designated critical habitats under the Ozark ATCAA airspace including the federally endangered Neosho mucket (*Lampsilis rafinesqueana*), federally threatened Niangua darter (*Etheostoma nianguae*), federally endangered Hine's emerald dragonfly, and federally endangered Indiana bat (*Myotis sodalis*). Federally designated critical habitat for the federally endangered whooping crane (*Grus americana*) occurs in the Smoky Hill Range. There is also federally designated critical habitat for the federally endangered Indiana bat under the Lindbergh MOA airspace. There are no federally designated critical habitats under the Cannon and Truman MOAs airspace (Attachment 5).

Effects Determinations

FACILITIES AND INFRASTRUCTURE

No federally listed or proposed for listing threatened, endangered, or candidate species are currently known to occur on Whiteman AFB. This assessment is based on historical surveys completed by the USDA, the MDC, and the base Natural Resource Manager as part of the installation's INRMP and natural resource program, with the most recent surveys completed in 2020 (Donaldson, 2023; Whiteman AFB, 2022). Additionally, no critical habitat occurs on or adjacent to Whiteman AFB (USFWS, 2023). Potential suitable habitats (i.e., foraging and roosting) for federally listed and proposed for listing bats are present in the mixed wood and hardwood urban forests, green belt areas, streams, and ponds on base. However, there are no known roost locations on the base (Donaldson, 2023; Whiteman AFB, 2022). None of the potential suitable habitat areas occur within the construction footprints for the proposed facilities and infrastructure projects.

No federally listed plant or animal species are known to occur on Whiteman AFB (Donaldson, 2023; Whiteman AFB, 2022). Additionally, there is no federally designated critical habitat on base (USFWS, 2023). As such, there would be *no effect* on the five federally listed species presented in Attachment 3 or critical habitats from the facilities and infrastructure projects proposed under the Whiteman AFB Alternative.

WEAPONS GENERATION FACILITY

North WGF Site Subalternative – Construction of the North WGF would occur within approximately 50.6 acres consisting of 42.4 acres of developed, open space and approximately 8.2 acres of deciduous forest. Additionally, the North WGF Site Subalternative would require the construction of two access roads, consisting of approximately 4 acres (including 0.5 acre of developed lands [paved surfaces] and 3.5 acres of developed/open space lands), and the relocation of the existing EOD range. The construction footprint for the North WGF Site, associated roads, and relocation of facilities are identified in Attachment 1.

While no federally listed species have been documented at Whiteman AFB, potential suitable habitat for four federally listed bat species (Indiana, northern long-eared, gray, and tri-colored) may be present within the 8.2 acres of deciduous forest habitats within the proposed North WGF footprint. Tree clearing can have a variety of impacts on bats depending on the quality, amount, location of the lost habitat and the time of year of clearing. To avoid potential effects to federally listed bat species, tree clearing within the North WGF footprint would not occur during the active and maternity season (April 1 – October 31) for bats. Tree clearing would be restricted exclusively to the inactive bat season to avoid direct impacts in the form of injury or death to individual bats that could be roosting in the deciduous forested areas. Additionally, tree clearing would follow conservation measures established for forest management as directed by the Natural Resource Manager and the Whiteman AFB Forest Management Plan (Whiteman AFB, 2018). Knob Noster State Park is located directly adjacent (northwest) to Whiteman AFB and is comprised of approximately 3,934 acres. The state park includes high-quality foraging and roosting habitat for bats that includes open oak woodland with a few patches of prairie along both sides of Clearfork Creek. Due to the quantity and availability of surrounding high-quality forested areas, the permanent loss of 8.2 acres of forested habitat that could support potential roosts, travel corridors, and foraging habitat for federally listed bats would not be considered significant. Based on implementation of seasonal avoidance measures and no documented occurrence of federally listed bat species at Whiteman AFB, the DAF has determined that the North WGF Site Subalternative would have *no effect* on the Indiana, northern long-eared, gray, and tri-colored bats. Similarly, there would be *no effect* to any of the other federally listed species presented in Attachment 3 as there are no documented occurrences of these species on base and potential suitable habitats for these species do not occur at the North WGF Site.

South WGF Site Subalternative – Construction of the South WGF would occur within about 50.3 acres of unimproved areas consisting of deciduous forest, pasture, and open water. Implementation of the South WGF Site Subalternative would also require the construction of up to three access roads consisting of approximately 2.9 acres of new roadway. The construction footprint for the South WGF Site Subalternative and associated roads are identified in Attachment 1.

At the South WGF Site, approximately 2.8 acres of deciduous forest habitats (potential suitable habitat for Indiana, northern long-eared, gray, and tri-colored bats) would be disturbed, as opposed to the 8.2 acres as part of the proposed North WGF Site. Impacts to biological resources from construction of the South WGF Site would be less than, or the same as those discussed for the North WGF Site. As such, the Proposed Action would have *no effect* on the Indiana, northern long-eared, gray, and tri-colored bat. Additionally, there would be *no effect* to any of the other federally listed species presented in Attachment 3.

AIRFIELD OPERATIONS

No federally listed plant or animal species are known to occur on Whiteman AFB (Whiteman AFB, 2022; Donaldson, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023).

Noise – Under the Whiteman AFB Alternative, airfield operations would increase from the baseline conditions at Whiteman AFB by approximately 6.7 percent and noise levels would increase slightly from the baseline conditions by 1 or 2 A-weighted decibels [dBA] day-night average sound level (DNL). Maximum noise levels from airfield operations would be 68 dBA DNL and the highest sound exposure level values typically experienced would not change compared to baseline conditions. Under the Whiteman AFB Alternative, the total overall on-base area encompassed by noise levels greater than 65 dBA DNL would increase by 146 acres compared to baseline conditions. Land off base affected by noise levels greater than 65 dBA DNL would also increase; however, there would be no off-base areas exposed to noise levels above 75 dBA DNL. Terrestrial species in these areas are already exposed to elevated noise under baseline conditions for B-2 operations. Threshold noise levels for mild responses to wildlife range from 65 decibels (dB) to 85 dB. Impacts to wildlife in newly exposed areas would likely be short term (lasting the duration of the overflight) and unlikely to significantly affect populations. Loud overflight events would be relatively infrequent. Overflights at the lowest allowable altitude would be extremely rare, and maximum noise levels would only occur at specific overflight locations and over an extremely short duration (a few seconds) while the aircraft is overhead. Species disturbances would be infrequent (spread out across the training airspace) and short term, lasting only the duration of the overflight. Since no federally listed species or designated critical habitat have been documented at Whiteman AFB, the DAF determines there would be *no effect* from increased noise associated with airfield operations under the Whiteman AFB Alternative.

Bird–aircraft collisions – A 6.7 percent increase in airfield operations may increase the potential for bird/wildlife aircraft strike encounters. However, the potential for bird/wildlife aircraft strikes could fluctuate because of the cyclical patterns of bird populations. During B-21 airfield operations at Whiteman AFB, current procedures for avoiding flight operations during periods of high concentrations of migratory birds would continue. Adherence to the existing bird/wildlife-aircraft strike hazard (BASH) Program and the USFWS-issued Depredation Permit conditions would minimize the risk of bird–aircraft strikes at Whiteman AFB, including those for migratory birds, and special status species birds to negligible levels. The Whiteman AFB BASH Plan provides guidance for bird/wildlife strike hazard reduction in areas where flying operations are conducted (Whiteman AFB, 2022). The conditions of the permit are updated annually. Additionally, all bird–aircraft strikes and hazards will continue to be reported per AFI 91-204, *Safety Investigations and Reports,* and AFMAN 91-223, *Aviation Safety Investigations and Reports.* Therefore, effects to ESA-listed species from airfield operations (specific to bird/wildlife–aircraft collisions) associated with B-21 airfield operations on the base are not anticipated to occur under the Whiteman AFB Alternative. The DAF determines there would be *no effect* to federally listed species from bird/wildlife strikes associated with increased airfield operations under the Whiteman AFB Alternative.

AIRSPACE AND RANGE UTILIZATION

Under the Whiteman AFB Alternative, aircraft operations within the Smoky Hill Range (Smoky MOA, Bison MOA and R-3601A/B) and Ada (East and West), Lindbergh (A, B, and C), Cannon (A and B) and Truman (A, B, and C) MOAs, including all associated ATCAAs, as well as the Ozark ATCAA (A, B, and C) would remain the same as under baseline conditions. Similarly, resulting noise levels from B-21 aircraft operations beneath the training airspace would remain the same. As such, the DAF determines that airspace and range utilization under the Whiteman AFB Alternative would have *no effect* on federally listed species and critical habitat identified in Attachment 4. Additionally, since no there would be ground disturbance under the airspace and direct impacts to habitat areas would not occur, the DAF determines there would be *no effect* to Indiana bat and whooping crane critical habitats.

PERSONNEL

The B-21 MOB 2 mission would require an increase in personnel to execute the proposed mission. However, impacts to federally listed or proposed listed species would not occur from this action. No federally listed plant or animal species are known to occur on Whiteman AFB (Whiteman AFB, 2022; Donaldson, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023).

Conclusion

In accordance with Section 7 of the ESA (16 U.S.C. §§ 1531–1544, as amended), the DAF determines that the B-21 MOB 2 beddown at Whiteman AFB would have *no effect* to ESA listed species and designated critical habitat. If there is a change in the Proposed Action that would modify this determination, the DAF would initiate consultation with your office, as appropriate. If you have any questions or concerns, please contact Keith Donaldson, Biological Scientist, at keith.donaldson.3@us.af.mil or (660) 687-6243. Thank you for your time.

Sincerely

Keith Donaldson, 509 CES/CEIEC, DAF
Biological Scientist

Attachments:

1. Map of Facilities, Infrastructure, and WGF Construction Footprints at Whiteman AFB
2. Airspace and Range Utilization for Whiteman AFB
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4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB
5. Federally Designated Critical Habitat Under Whiteman AFB Airspace

References:

DAF. (2021). *B-21 Main Operating Base 1 (MOB 1) Beddown at Dyess AFB, Texas or Ellsworth AFB, South Dakota Final Environmental Impact Statement.*

Donaldson, K. (2023, January 30). Personal communication between Keith Donaldson, (Biological Scientist, Whiteman AFB) and Sarah Rauch (Biologist, Leidos). *RE: Observations of Special Status Species at Dyess AFB. January 30.*

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USFWS. (2023, January 25). *Official Species List*. Retrieved from U.S. Fish and Wildlife Service Information for Planning and Consultation: https://ecos.fws.gov/ipac/

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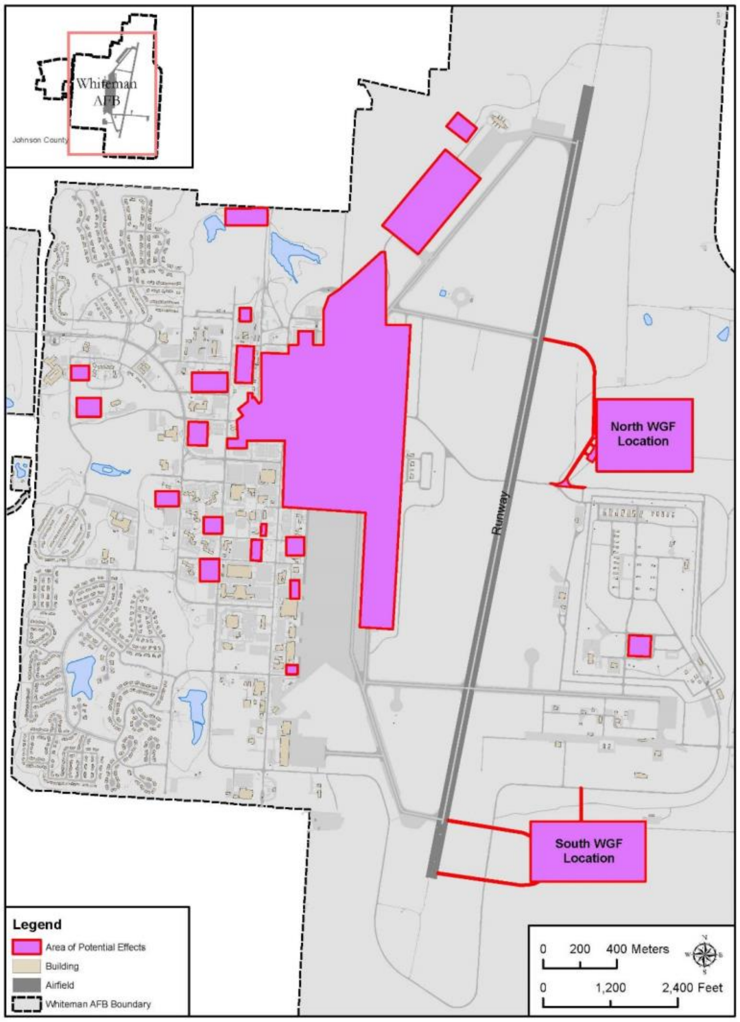
Whiteman AFB. (2022). *Integrated Natural Resources Management Plan.* Johnson County, Missouri: Whiteman Air Force Base.

Attachment 1:
Map of Facilities, Infrastructure, and WGF Construction Footprints at Whiteman AFB



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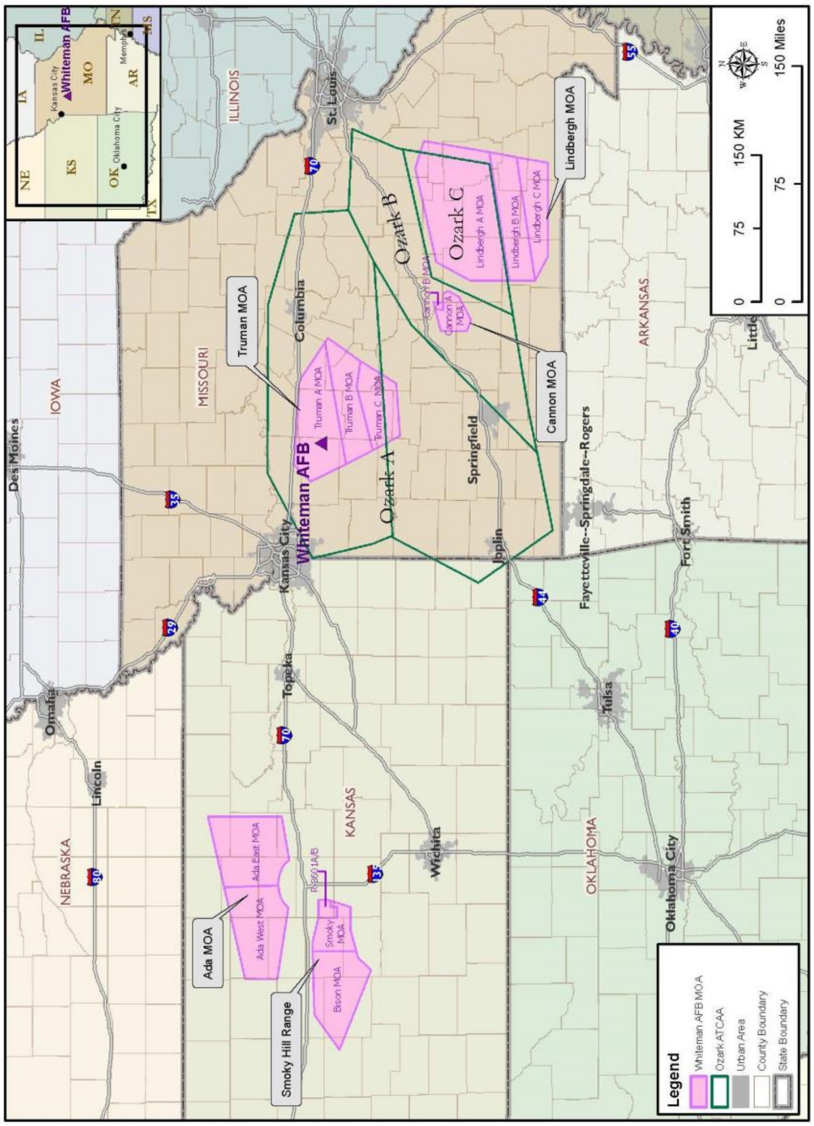
Attachment 2: Airspace and Range Utilization for Whiteman AFB



Attachment 3: Federally Listed Species with the Potential to Occur at Whiteman AFB

Common Name	Scientific Name	Protection Status	Potential for Occurrence at Whiteman AFB
Mammals			
Indiana Bat	*Myotis sodalis*	Endangered	Yes. Potential suitable foraging habitat occurs along the stream corridors with well-developed riparian woods. Roosting habitat may be present within hardwood forested areas within the installation and surrounding areas (northwest corner of the base, within the Royal Oaks Golf Course, and in Knob Noster Park).
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	
Gray Bat	*Myotis grisescens*	Endangered	Yes. Potential suitable foraging habitat occurs along the stream corridors and riparian woods. Suitable roosting habitat (caves) not present on base.
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Yes. Potential suitable foraging habitat occurs along the stream corridors and riparian woods. Suitable roosting habitat (i.e., caves and mines) not present on base.
Insects			
Monarch Butterfly	*Danaus plexippus*	Candidate	Potential spring and winter migrant throughout the state. Monarchs migrate north to the United States and Canada in March from the mature oyamel fir forests in the mountains of central Mexico. The fall migration back to overwintering sites in Mexico is from August to November.

Sources: Sources: (USFWS, 2023) (Whiteman AFB, 2022)
Key: % = percent; AFB = Air Force Base; ROI = region of influence

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Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Birds					
Whooping Crane	*Grus americana*	Endangered	Ada Cannon Ozark Smoky Hill Range	Smoky Hill Range	Yes. Whooping cranes are regular spring and fall transients through Kansas. Whooping cranes utilize sloughs, marshes, rivers, lakes, ponds, croplands, and pastures.
Red Knot	*Calidris canutus rufa*	Threatened	Cannon Ozark	None	Yes. Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding occurs outside of the ROI in the central Canadian Arctic.
Piping Plover	*Charadrius melodus*	Threatened	Cannon Ozark	None	Yes. Potential during migration. The piping plover is a biannual migrant in Oklahoma, traveling between its nesting habitat to the north of Oklahoma (the Great Plains population nests from Kansas to southern Canada), and its wintering grounds on the Gulf coast.
Mammals					
Indiana Bat	*Myotis sodalis*	Endangered	Cannon, Lindbergh, Ozark Truman	Lindbergh Ozark	Yes. Known occurrences in the ROI. Missouri's numerous cave systems and sinkholes, provide year-round roosting locations for bat populations. In Kansas, bats utilize wooded or semi-wooded areas.
Gray Bat	*Myotis grisescens*	Endangered	Cannon, Lindbergh, Ozark Truman	None	
Northern Long-Eared Bat	*Myotis septentrionalis*	Endangered	Ada Cannon, Lindbergh, Ozark Smoky Hill Range Truman	None	Yes. Known occurrences within the ROI. Species range includes 39 states. Roost in caves, mines, and live and dead trees.

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Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Ozark Big-Eared Bat	*Corynorhinus (=Plecotus) townsendii ingens*	Endangered	Cannon Ozark	None	Unknown. Found only in a small number of caves in Arkansas, Oklahoma, and Missouri. Inhabits caves year-round. The caves typically are in oak–hickory hardwood forest.
Tri-Colored Bat	*Perimyotis subflavus*	Proposed Endangered	Cannon Ozark Truman	None	Yes. Species potential habitat includes the ROI. Found in a variety of terrestrial habitats, including grasslands, old fields, suburban areas, orchards, urban areas and woodlands.

Source: (USFWS, 2023)
Key: ROI = region of influence; USFWS = U.S. Fish and Wildlife Service
Note:
The ROI for federally listed species under the airspace only applies to various bird and mammal species known to occur or with potential to occur in these areas and that have the potential to be impacted by noise associated with B-21 aircraft operations.

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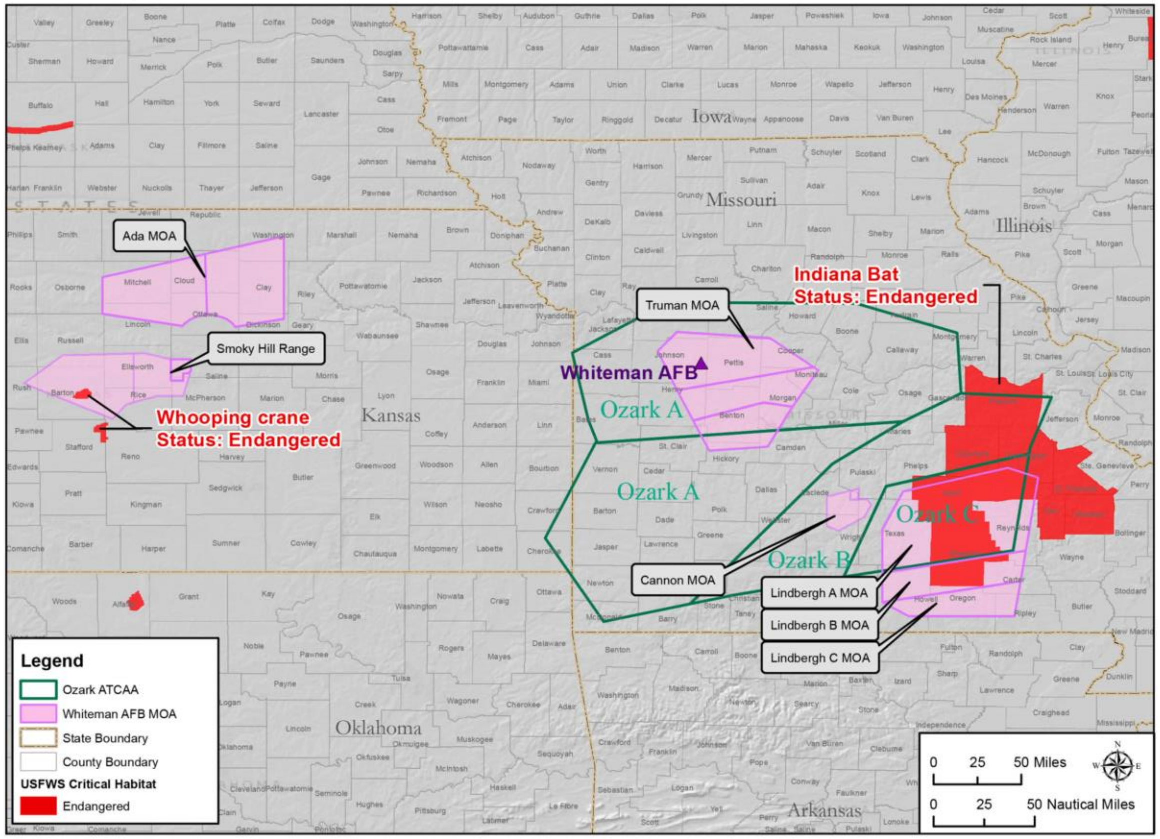
Attachment 5: Critical Habitat Under Whiteman AFB Airspace



D.2.2.2 USFWS, Kansas Ecological Services Field Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

June 2, 2023

Keith Donaldson
Biological Scientist
509 CES/CEIEC
Whiteman AFB MO 65305

Jason Luginbill, Field Supervisor
USFWS, Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan KS 66502

Dear Mr. Luginbill

The Department of Defense (DoD) is developing a new bomber aircraft, the B-21 "Raider," which will eventually replace existing B-1 and B-2 bomber aircraft. The beddown of the B-21 will take place through a series of beddowns at three Main Operating Bases (MOBs), referred to as MOB 1, MOB 2, and MOB 3. The Department of the Air Force (DAF) previously chose Ellsworth AFB for MOB 1 in a Record of Decision signed in June 2021 (DAF, 2021). The DAF is now preparing an additional Environmental Impact Statement (EIS) to evaluate the potential environmental consequences associated with establishing the second beddown, MOB 2, at the remaining two alternative bases: Dyess AFB or Whiteman AFB.

The MOB 2 EIS evaluates the impacts from the Proposed Action on the current USFWS trust resources (defined as: threatened, endangered, proposed, and candidate species; proposed and final designated critical habitat; migratory birds; and wetlands) with the potential to occur within the region of influence (ROI). Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the DAF has determined that the B-21 MOB 2 beddown at Whiteman AFB will have *no effect* on federally listed species. Rationales for these effects determinations for federally listed and proposed listed species are described herein.

Proposed Action

The EIS considers two alternative locations for the MOB 2 beddown of the B-21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities associated with the B-21 would occur. The Proposed Action includes the following activities:

- Facilities and infrastructure projects associated with establishing the B-21 Operations Squadrons, Weapons Instructor Course, and Operational Test and Evaluation
- Construction of a Weapons Generation Facility (WGF), including two Subalternatives:
    - The North WGF Site
    - The South WGF Site
- Airfield operations

DEFEND...AVENGE!

- Airspace and range utilization; and
- Increasing numbers of personnel to support and conduct B-21 aircraft operations.

The ROI for biological resources for beddown actions at Whiteman AFB occurs within the installation boundaries, specifically areas that encompass the construction footprints for proposed facilities and infrastructure projects and construction of the WGF (Attachment 1). The analysis also considers noise and bird–aircraft collisions associated with B-21 airfield operations on the base.

For B-21 airspace and range utilization, the ROI for biological resources includes the lands under the airspace and associated range boundaries. For Whiteman AFB, military aircraft will utilize the Smoky Hill Range (Smoky MOA, Bison MOA, and R-3601A/B), the Ada (East and West), Lindbergh (A, B, C), Cannon, and Truman (A, B, C) MOAs, including all associated ATCAAs, as well as the Ozark ATCAA (A, B, C) (Attachment 2). There are no plans to modify any of the airspace as a result of the Proposed Action. Since no ground disturbance would occur under the airspace during B-21 aircraft operations, terrestrial and aquatic vegetation, amphibians, reptiles, fish, and macroinvertebrates were excluded from further analysis. Additionally, wildlife habitat areas are not considered further since there would not be direct or indirect impacts from aircraft operations in the airspace. Therefore, the analysis for potential impacts to biological resources from airspace and range utilization only applies to mammalian and avian wildlife species known to occur in these areas and that have the potential to be impacted by noise and bird–aircraft collisions associated with B-21 aircraft operations.

Threatened, Endangered, and Candidate Species and Critical Habitat

The Whiteman AFB Integrated Natural Resource Management Plan (INRMP) (Whiteman AFB, 2022) and the USFWS Information for Planning and Consultation (IPaC) online system (USFWS, 2023) were reviewed to determine if any federally listed, proposed, or candidate species, or their habitats, could potentially occur within the ROI. The IPaC Report generated an *Official Species List* of species protected under Section 7(c) of the ESA that could occur within the ROI (Project Code: 2023-0038069) (Attachment 3) (USFWS, 2023).

Federally listed species with potential to occur under the Whiteman AFB airspace units are listed in Attachment 4, which is based on an IPaC query for this project (USFWS, 2023). Federally designated critical habitats were also evaluated. GIS data queries verified that there are federally designated critical habitats under the Ozark ATCAA airspace including the federally endangered Neosho mucket (*Lampsilis rafinesqueana*), federally threatened Niangua darter (*Etheostoma nianguae*), federally endangered Hine's emerald dragonfly, and federally endangered Indiana bat (*Myotis sodalis*). Federally designated critical habitat for the federally endangered whooping crane (*Grus americana*) occurs in the Smoky Hill Range. There is also federally designated critical habitat for the federally endangered Indiana bat under the Lindbergh MOA airspace. There are no federally designated critical habitats under the Cannon and Truman MOAs airspace (Attachment 5).

Effects Determinations

FACILITIES AND INFRASTRUCTURE

No federally listed or proposed for listing threatened, endangered, or candidate species are currently known to occur on Whiteman AFB. This assessment is based on historical surveys completed by the USDA, the MDC, and the base Natural Resource Manager as part of the

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installation's INRMP and natural resource program, with the most recent surveys completed in 2020 (Donaldson, 2023; Whiteman AFB, 2022). Additionally, no critical habitat occurs on or adjacent to Whiteman AFB (USFWS, 2023). Potential suitable habitats (i.e., foraging and roosting) for federally listed and proposed for listing bats are present in the mixed wood and hardwood urban forests, green belt areas, streams, and ponds on base. However, there are no known roost locations on the base (Donaldson, 2023; Whiteman AFB, 2022). None of the potential suitable habitat areas occur within the construction footprints for the proposed facilities and infrastructure projects.

No federally listed plant or animal species are known to occur on Whiteman AFB (Donaldson, 2023; Whiteman AFB, 2022). Additionally, there is no federally designated critical habitat on base (USFWS, 2023). As such, there would be *no effect* on the five federally listed species presented in Attachment 3 or critical habitats from the facilities and infrastructure projects proposed under the Whiteman AFB Alternative.

WEAPONS GENERATION FACILITY

North WGF Site Subalternative – Construction of the North WGF would occur within approximately 50.6 acres consisting of 42.4 acres of developed, open space and approximately 8.2 acres of deciduous forest. Additionally, the North WGF Site Subalternative would require the construction of two access roads, consisting of approximately 4 acres (including 0.5 acre of developed lands [paved surfaces] and 3.5 acres of developed/open space lands), and the relocation of the existing EOD range. The construction footprint for the North WGF Site, associated roads, and relocation of facilities are identified in Attachment 1.

While no federally listed species have been documented at Whiteman AFB, potential suitable habitat for four federally listed bat species (Indiana, northern long-eared, gray, and tri-colored) may be present within the 8.2 acres of deciduous forest habitats within the proposed North WGF footprint. Tree clearing can have a variety of impacts on bats depending on the quality, amount, location of the lost habitat and the time of year of clearing. To avoid potential effects to federally listed bat species, tree clearing within the North WGF footprint would not occur during the active and maternity season (April 1 – October 31) for bats. Tree clearing would be restricted exclusively to the inactive bat season to avoid direct impacts in the form of injury or death to individual bats that could be roosting in the deciduous forested areas. Additionally, tree clearing would follow conservation measures established for forest management as directed by the Natural Resource Manager and the Whiteman AFB Forest Management Plan (Whiteman AFB, 2018). Knob Noster State Park is located directly adjacent (northwest) to Whiteman AFB and is comprised of approximately 3,934 acres. The state park includes high-quality foraging and roosting habitat for bats that includes open oak woodland with a few patches of prairie along both sides of Clearfork Creek. Due to the quantity and availability of surrounding high-quality forested areas, the permanent loss of 8.2 acres of forested habitat that could support potential roosts, travel corridors, and foraging habitat for federally listed bats would not be considered significant. Based on implementation of seasonal avoidance measures and no documented occurrence of federally listed bat species at Whiteman AFB, the DAF has determined that the North WGF Site Subalternative would have *no effect* on the Indiana, northern long-eared, gray, and tri-colored bats. Similarly, there would be *no effect* to any of the other federally listed species presented in Attachment 3 as there are no documented occurrences of these species on base and potential suitable habitats for these species do not occur at the North WGF Site.

South WGF Site Subalternative – Construction of the South WGF would occur within about 50.3 acres of unimproved areas consisting of deciduous forest, pasture, and open water. Implementation of the South WGF Site Subalternative would also require the construction of up to three access roads consisting of approximately 2.9 acres of new roadway. The construction footprint for the South WGF Site Subalternative and associated roads are identified in Attachment 1.

At the South WGF Site, approximately 2.8 acres of deciduous forest habitats (potential suitable habitat for Indiana, northern long-eared, gray, and tri-colored bats) would be disturbed, as opposed to the 8.2 acres as part of the proposed North WGF Site. Impacts to biological resources from construction of the South WGF Site would be less than, or the same as those discussed for the North WGF Site. As such, the Proposed Action would have *no effect* on the Indiana, northern long-eared, gray, and tri-colored bat. Additionally, there would be *no effect* to any of the other federally listed species presented in Attachment 3.

AIRFIELD OPERATIONS

No federally listed plant or animal species are known to occur on Whiteman AFB (Whiteman AFB, 2022; Donaldson, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023).

Noise – Under the Whiteman AFB Alternative, airfield operations would increase from the baseline conditions at Whiteman AFB by approximately 6.7 percent and noise levels would increase slightly from the baseline conditions by 1 or 2 A-weighted decibels [dBA] day-night average sound level (DNL). Maximum noise levels from airfield operations would be 68 dBA DNL and the highest sound exposure level values typically experienced would not change compared to baseline conditions. Under the Whiteman AFB Alternative, the total overall on-base area encompassed by noise levels greater than 65 dBA DNL would increase by 146 acres compared to baseline conditions. Land off base affected by noise levels greater than 65 dBA DNL would also increase; however, there would be no off-base areas exposed to noise levels above 75 dBA DNL. Terrestrial species in these areas are already exposed to elevated noise under baseline conditions for B-2 operations. Threshold noise levels for mild responses to wildlife range from 65 decibels (dB) to 85 dB. Impacts to wildlife in newly exposed areas would likely be short term (lasting the duration of the overflight) and unlikely to significantly affect populations. Loud overflight events would be relatively infrequent. Overflights at the lowest allowable altitude would be extremely rare, and maximum noise levels would only occur at specific overflight locations and over an extremely short duration (a few seconds) while the aircraft is overhead. Species disturbances would be infrequent (spread out across the training airspace) and short term, lasting only the duration of the overflight. Since no federally listed species or designated critical habitat have been documented at Whiteman AFB, the DAF determines there would be *no effect* from increased noise associated with airfield operations under the Whiteman AFB Alternative.

Bird–aircraft collisions – A 6.7 percent increase in airfield operations may increase the potential for bird/wildlife aircraft strike encounters. However, the potential for bird/wildlife aircraft strikes could fluctuate because of the cyclical patterns of bird populations. During B-21 airfield operations at Whiteman AFB, current procedures for avoiding flight operations during periods of high concentrations of migratory birds would continue. Adherence to the existing bird/wildlife-aircraft strike hazard (BASH) Program and the USFWS-issued Depredation Permit conditions would minimize the risk of bird–aircraft strikes at Whiteman AFB, including those for migratory birds, and special status species birds to negligible levels. The Whiteman AFB BASH Plan provides guidance for bird/wildlife strike hazard reduction in areas where flying operations are conducted (Whiteman AFB, 2022). The conditions of the permit are updated annually. Additionally, all bird–aircraft strikes and hazards will continue to be reported per AFI 91-204, *Safety Investigations and Reports,* and AFMAN 91-223, *Aviation Safety Investigations and Reports.* Therefore, effects to ESA-listed species from airfield operations (specific to bird/wildlife–aircraft collisions) associated with B-21 airfield operations on the base are not anticipated to occur under the Whiteman AFB Alternative. The DAF determines there would be *no effect* to federally listed species from bird/wildlife strikes associated with increased airfield operations under the Whiteman AFB Alternative.

Airspace and Range Utilization

Under the Whiteman AFB Alternative, aircraft operations within the Smoky Hill Range (Smoky MOA, Bison MOA and R-3601A/B) and Ada (East and West), Lindbergh (A, B, and C), Cannon (A and B) and Truman (A, B, and C) MOAs, including all associated ATCAAs, as well as the Ozark ATCAA (A, B, and C) would remain the same as under baseline conditions. Similarly, resulting noise levels from B-21 aircraft operations beneath the training airspace would remain the same. As such, the DAF determines that airspace and range utilization under the Whiteman AFB Alternative would have *no effect* on federally listed species and critical habitat identified in Attachment 4. Additionally, since no there would be ground disturbance under the airspace and direct impacts to habitat areas would not occur, the DAF determines there would be *no effect* to Indiana bat and whooping crane critical habitats.

Personnel

The B-21 MOB 2 mission would require an increase in personnel to execute the proposed mission. However, impacts to federally listed or proposed listed species would not occur from this action. No federally listed plant or animal species are known to occur on Whiteman AFB (Whiteman AFB, 2022; Donaldson, 2023). Additionally, there is no federally designated critical habitat on base (USFWS, 2023).

Conclusion

In accordance with Section 7 of the ESA (16 U.S.C. §§ 1531–1544, as amended), the DAF determines that the B-21 MOB 2 beddown at Whiteman AFB would have *no effect* to ESA listed species and designated critical habitat. If there is a change in the Proposed Action that would modify this determination, the DAF would initiate consultation with your office, as appropriate. If you have any questions or concerns, please contact Keith Donaldson, Biological Scientist, at keith.donaldson.3@us.af.mil or (660) 687-6243. Thank you for your time.

Sincerely

Keith Donaldson, 509 CES/CEIEC, DAF
Biological Scientist

Attachments:
1. Map of Facilities, Infrastructure, and WGF Construction Footprints at Whiteman AFB
2. Airspace and Range Utilization for Whiteman AFB
3. Federally Listed Species with the Potential to Occur at Whiteman AFB
4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB
5. Federally Designated Critical Habitat Under Whiteman AFB Airspace

References:

DAF. (2021). *B-21 Main Operating Base 1 (MOB 1) Beddown at Dyess AFB, Texas or Ellsworth AFB, South Dakota Final Environmental Impact Statement.*

Donaldson, K. (2023, January 30). Personal communication between Keith Donaldson, (Biological Scientist, Whiteman AFB) and Sarah Rauch (Biologist, Leidos). *RE: Observations of Special Status Species at Dyess AFB. January 30.*

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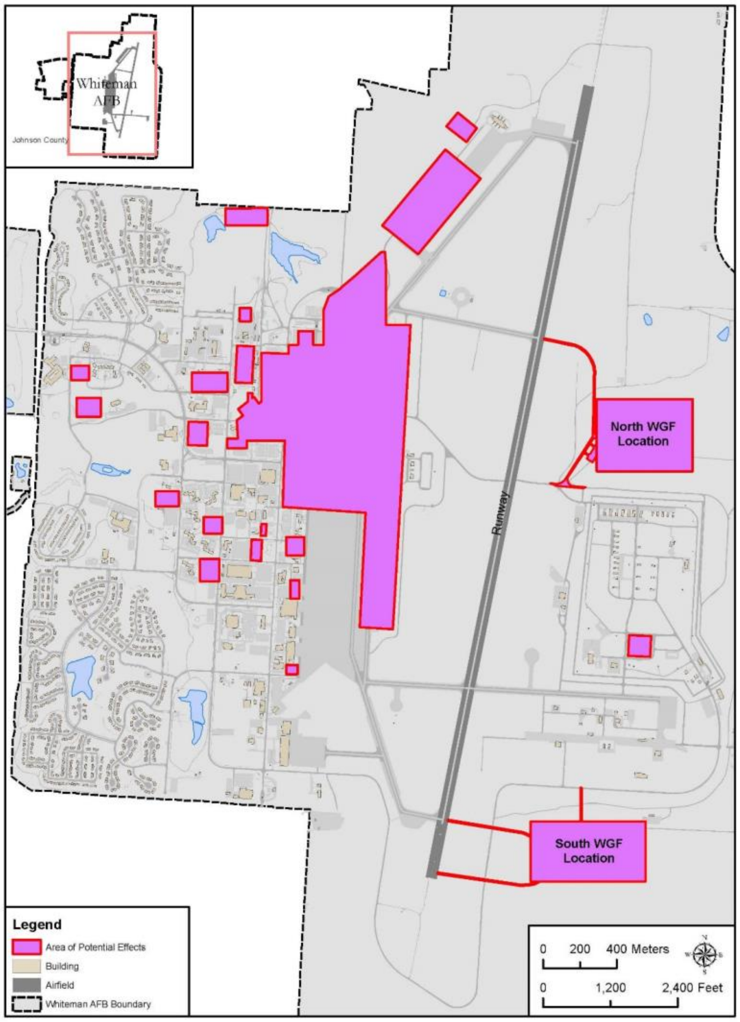
Whiteman AFB. (2022). *Integrated Natural Resources Management Plan.* Johnson County, Missouri: Whiteman Air Force Base.

Attachment 1:
Map of Facilities, Infrastructure, and WGF Construction Footprints at Whiteman AFB



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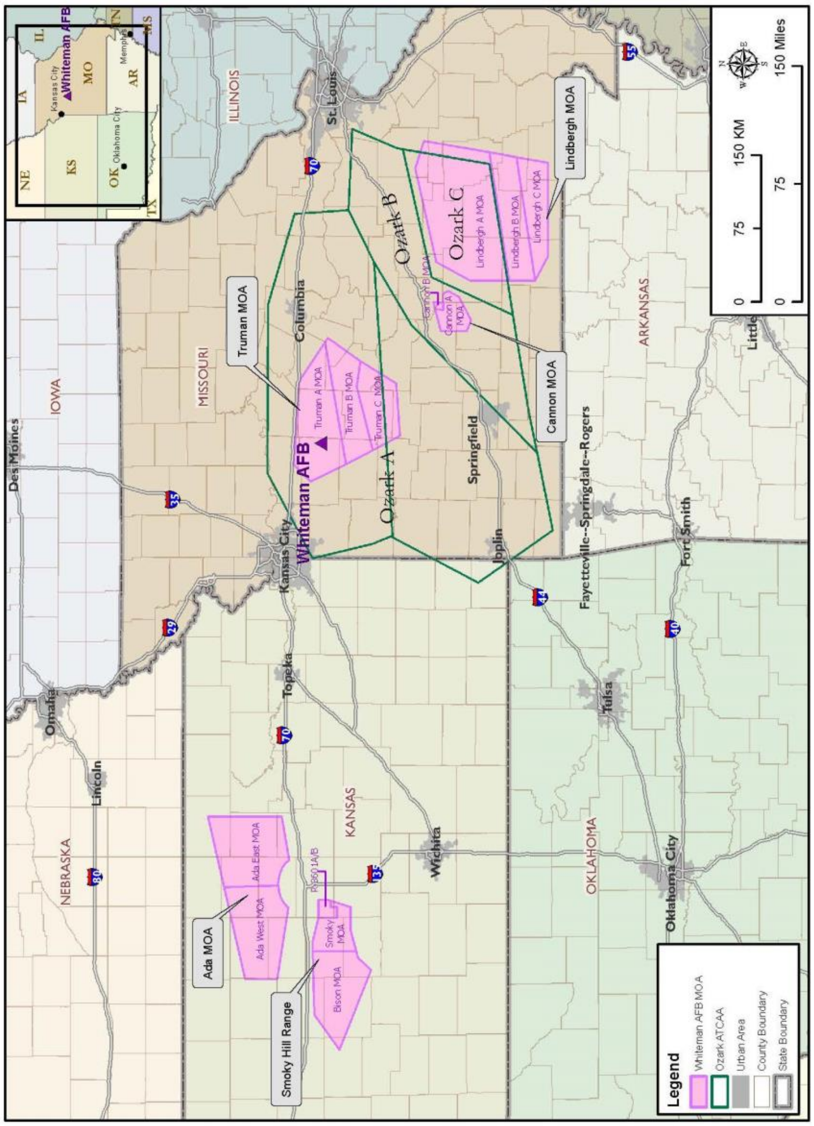
Attachment 2: Airspace and Range Utilization for Whiteman AFB



Attachment 3: Federally Listed Species with the Potential to Occur at Whiteman AFB

Common Name	Scientific Name	Protection Status	Potential for Occurrence at Whiteman AFB
Mammals			
Indiana Bat	*Myotis sodalis*	Endangered	Yes. Potential suitable foraging habitat occurs along the stream corridors with well-developed riparian woods. Roosting habitat may be present within hardwood forested areas within the installation and surrounding areas (northwest corner of the base, within the Royal Oaks Golf Course, and in Knob Noster Park).
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	
Gray Bat	*Myotis grisescens*	Endangered	Yes. Potential suitable foraging habitat occurs along the stream corridors and riparian woods. Suitable roosting habitat (caves) not present on base.
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Yes. Potential suitable foraging habitat occurs along the stream corridors and riparian woods. Suitable roosting habitat (i.e., caves and mines) not present on base.
Insects			
Monarch Butterfly	*Danaus plexippus*	Candidate	Potential spring and winter migrant throughout the state. Monarchs migrate north to the United States and Canada in March from the mature oyamel fir forests in the mountains of central Mexico. The fall migration back to overwintering sites in Mexico is from August to November.

Sources: Sources: (USFWS, 2023) (Whiteman AFB, 2022)
Key: % = percent; AFB = Air Force Base; ROI = region of influence

Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Birds					
Whooping Crane	*Grus americana*	Endangered	Ada Cannon Ozark Smoky Hill Range	Smoky Hill Range	Yes. Whooping cranes are regular spring and fall transients through Kansas. Whooping cranes utilize sloughs, marshes, rivers, lakes, ponds, croplands, and pastures.
Red Knot	*Calidris canutus rufa*	Threatened	Cannon Ozark	None	Yes. Potential during migration. Red knots are long-distance migrants flying more than 9,300 miles. Stopover habitat includes aquatic areas. Breeding occurs outside of the ROI in the central Canadian Arctic.
Piping Plover	*Charadrius melodus*	Threatened	Cannon Ozark	None	Yes. Potential during migration. The piping plover is a biannual migrant in Oklahoma, traveling between its nesting habitat to the north of Oklahoma (the Great Plains population nests from Kansas to southern Canada), and its wintering grounds on the Gulf coast.
Mammals					
Indiana Bat	*Myotis sodalis*	Endangered	Cannon, Lindbergh, Ozark Truman	Lindbergh Ozark	Yes. Known occurrences in the ROI. Missouri's numerous cave systems and sinkholes, provide year-round roosting locations for bat populations. In Kansas, bats utilize wooded or semi-wooded areas.
Gray Bat	*Myotis grisescens*	Endangered	Cannon, Lindbergh, Ozark Truman	None	
Northern Long-Eared Bat	*Myotis septentrionalis*	Endangered	Ada Cannon, Lindbergh, Ozark Smoky Hill Range Truman	None	Yes. Known occurrences within the ROI. Species range includes 39 states. Roost in caves, mines, and live and dead trees.

Attachment 4: Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB

Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Ozark Big-Eared Bat	*Corynorhinus (=Plecotus) townsendii ingens*	Endangered	Cannon Ozark	None	Unknown. Found only in a small number of caves in Arkansas, Oklahoma, and Missouri. Inhabits caves year-round. The caves typically are in oak–hickory hardwood forest.
Tri-Colored Bat	*Perimyotis subflavus*	Proposed Endangered	Cannon Ozark Truman	None	Yes. Species potential habitat includes the ROI. Found in a variety of terrestrial habitats, including grasslands, old fields, suburban areas, orchards, urban areas and woodlands.

Source: (USFWS, 2023)
Key: ROI = region of influence; USFWS = U.S. Fish and Wildlife Service
Note:
The ROI for federally listed species under the airspace only applies to various bird and mammal species known to occur or with potential to occur in these areas and that have the potential to be impacted by noise associated with B-21 aircraft operations.

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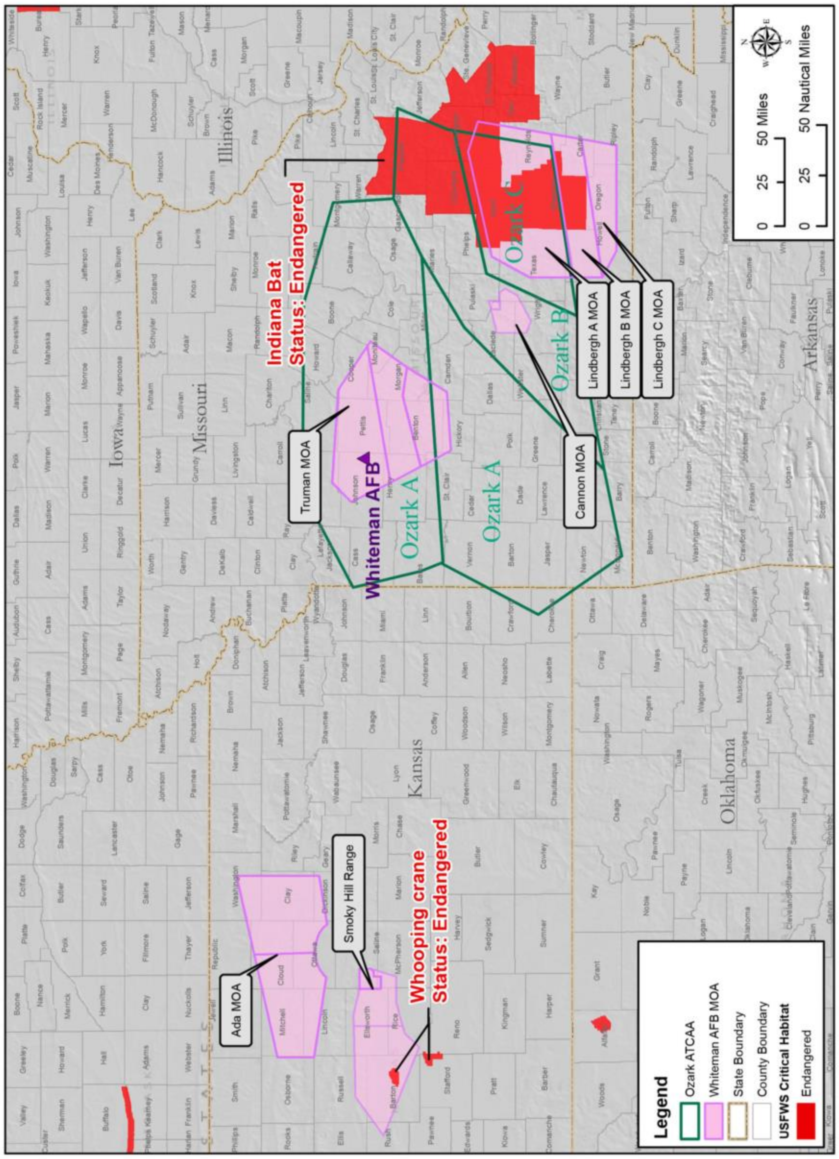
Attachment 5: Critical Habitat Under Whiteman AFB Airspace



D.3 REFERENCES

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APPENDIX E

CULTURAL RESOURCES

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E. CULTURAL RESOURCES SUPPORTING INFORMATION

E.1 NATIVE AMERICAN CONSULTATION

E.1.1 Dyess Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Bobby Komardly, Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadrarko OK 73005

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Komardly

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Apache Tribe of Oklahoma. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Apache Tribe of Oklahoma on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
Bldg. 4111	7,089	Demolition
Bldg. 4112	5,792	Demolition
Bldg. 4119	3,382	Demolition
Bldg. 4160	1,358	Demolition
Bldg. 4217	15,875	Demolition
Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
Note:
a. The National Airborne Operations Center Support facility is not part of the B-21 program but is a connected action as a result of displacement due to the beddown of the B-21.

The APE for this undertaking is therefore defined as the planned facilities and infrastructure projects described in **Error! Reference source not found.** and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations.

Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

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If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

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The Apache Tribe of Oklahoma has determined that:

- ☐ There is a potential for significant sites to the Apache Tribe of Oklahoma and the Tribe would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Apache Tribe of Oklahoma are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Apache Tribe of Oklahoma are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Apache Tribe of Oklahoma are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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Phone: ___________________________________

E-mail: ___________________________________

Signature: ________________________________

Date: _____________________________________

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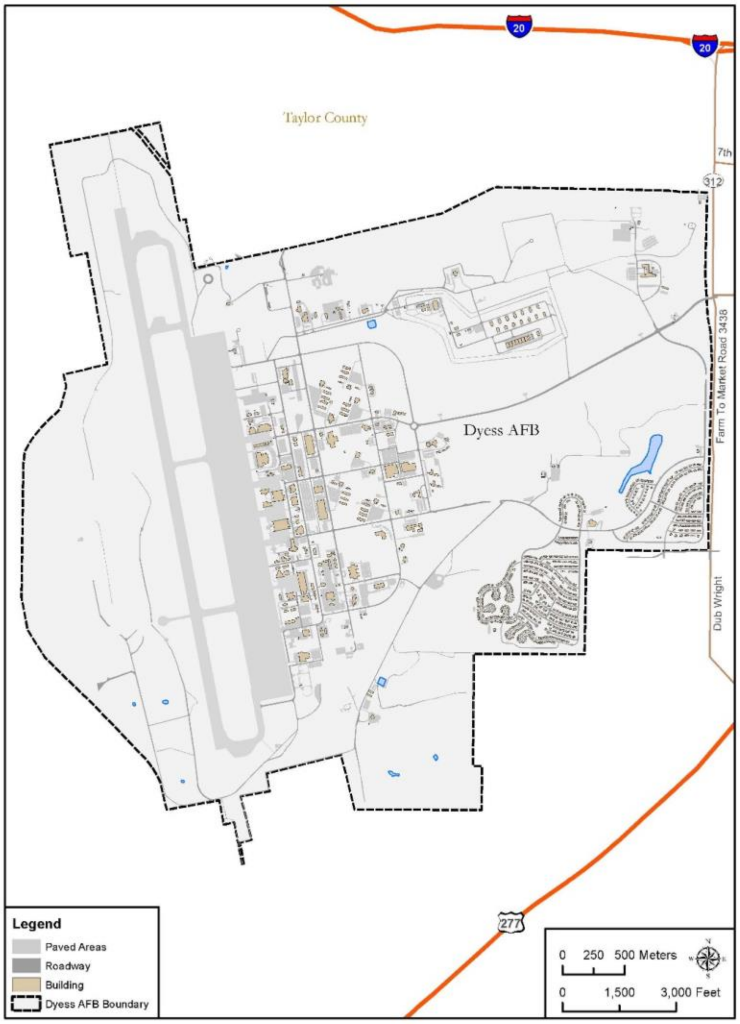
Attachment 1 – Dyess AFB Location



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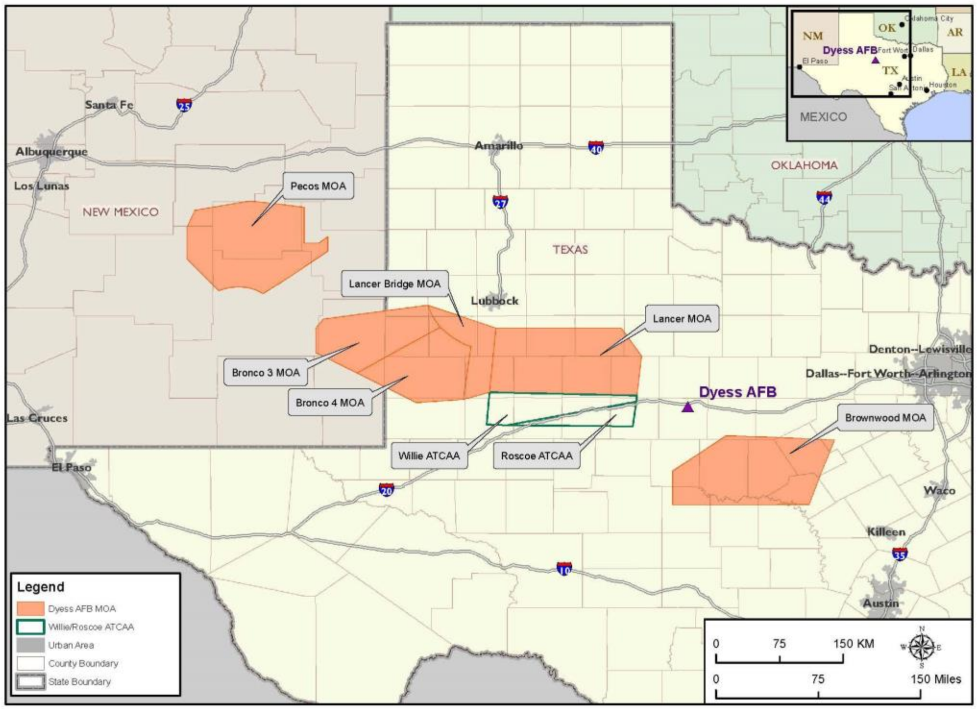
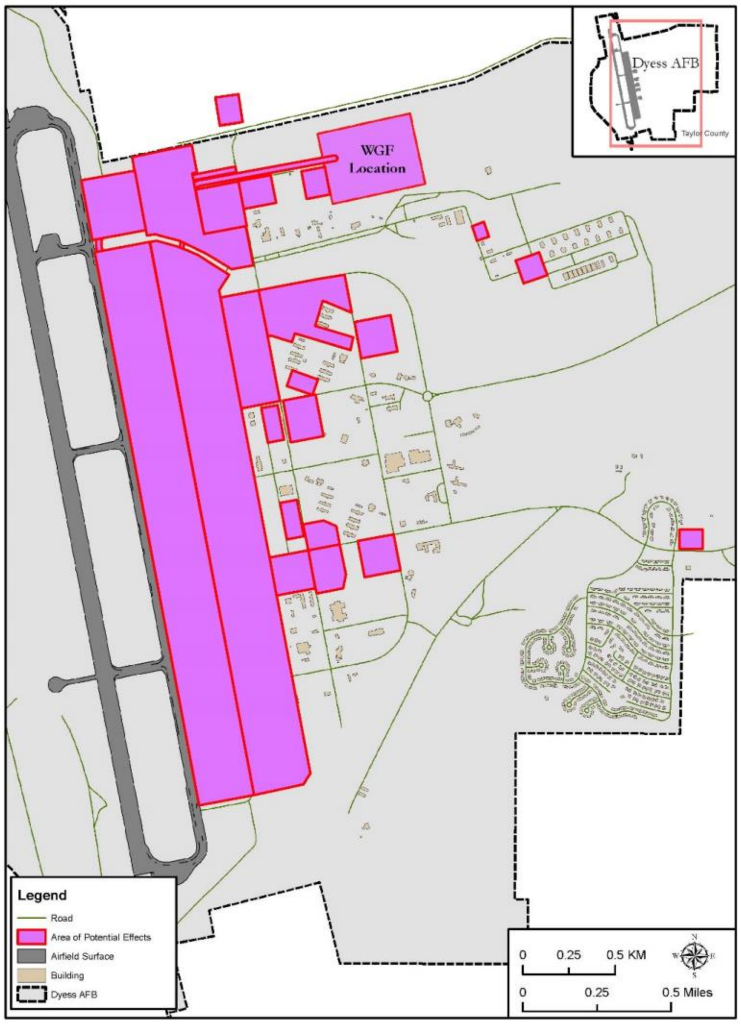
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Tammy Francis-Fourkiller, Chairman
Caddo Nation of Oklahoma
P.O. Box 487
Binger OK 73009

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Francis-Fourkiller

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Caddo Nation of Oklahoma. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Caddo Nation of Oklahoma on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

1

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
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If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

The Caddo Nation of Oklahoma has determined that:

- ☐ There is a potential for significant sites to the Caddo Nation of Oklahoma would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Caddo Nation of Oklahoma are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Caddo Nation of Oklahoma are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
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- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

____

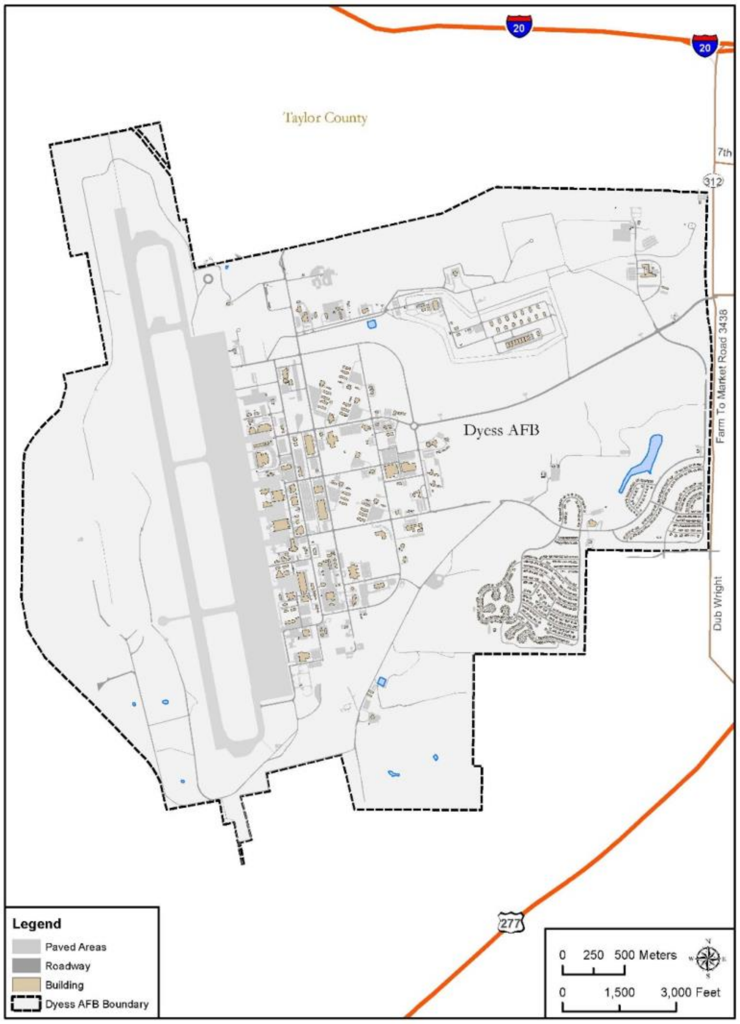
Phone: ___________________________________

E-mail: ___________________________________

Signature: ________________________________

Date: _____________________________________

Attachment 1 – Dyess AFB Location



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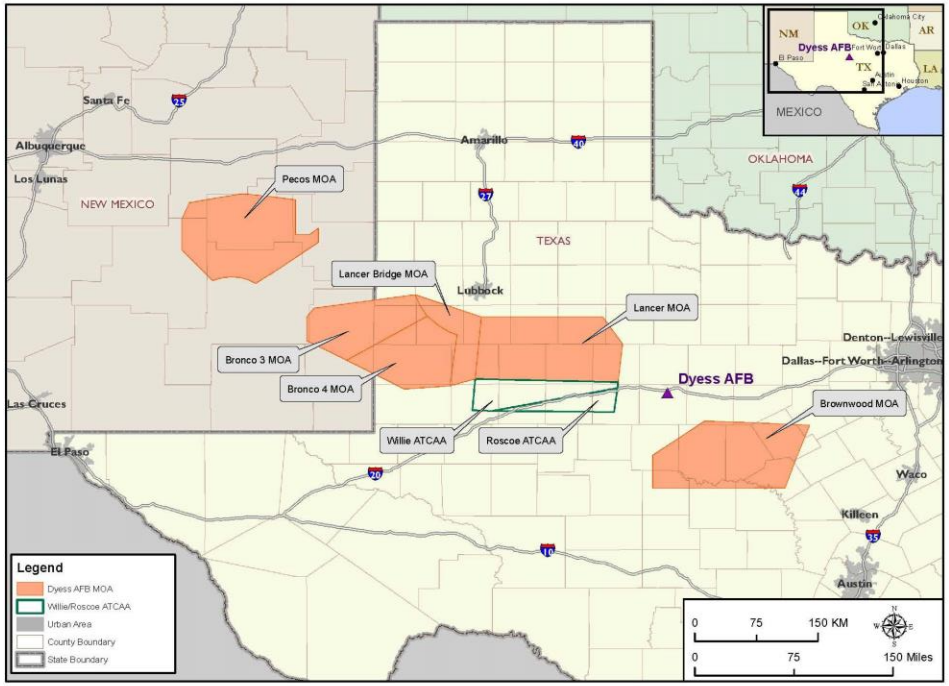
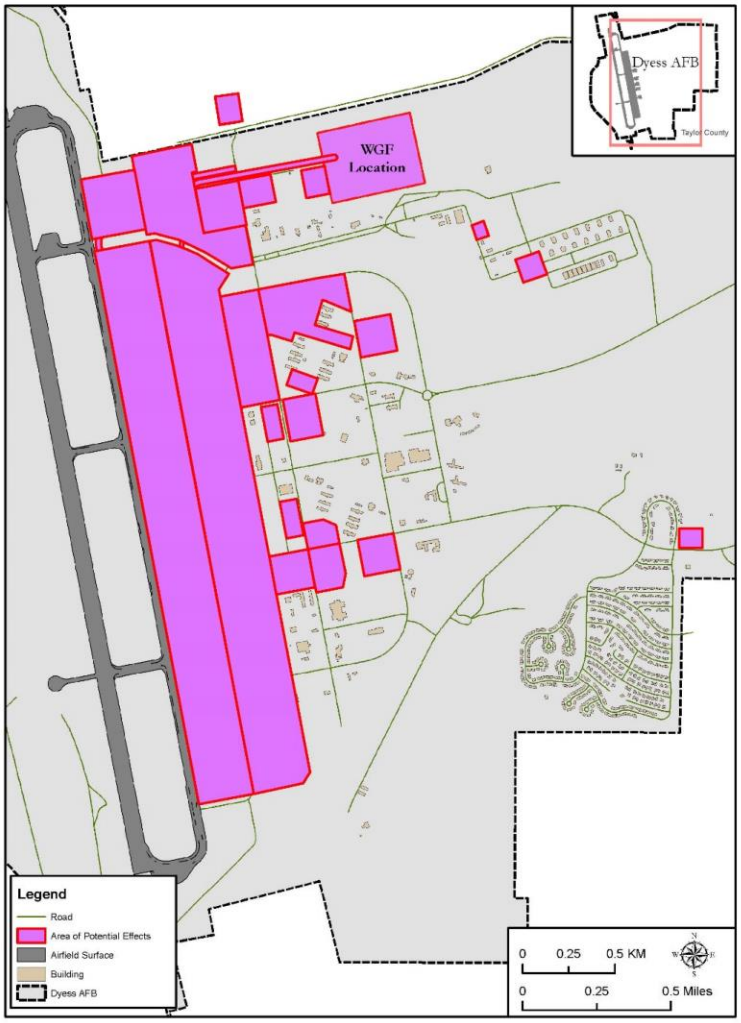
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

William Nelson Sr., Chairman
Comanche Nation
P.O. Box 908
Lawton OK 73502

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Nelson

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

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I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Comanche Nation. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Comanche Nation on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

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Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

The Comanche Nation has determined that:

☐ There is a potential for significant sites to the Comanche Nation would like to visit/investigate.

☐ Historic properties of religious and cultural significance to the Comanche Nation are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.

☐ Historic properties of religious and cultural significance to the Comanche Nation are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.

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☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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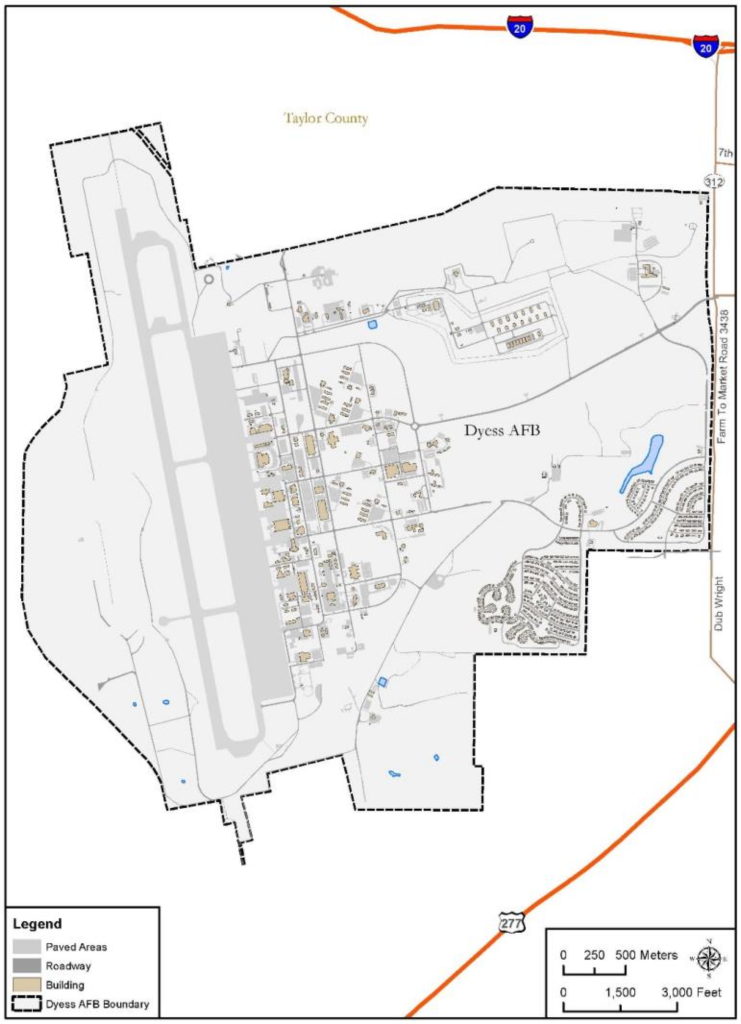
Phone: ___________________________________

E-mail: ___________________________________

Signature: ________________________________

Date: _____________________________________

Attachment 1 – Dyess AFB Location



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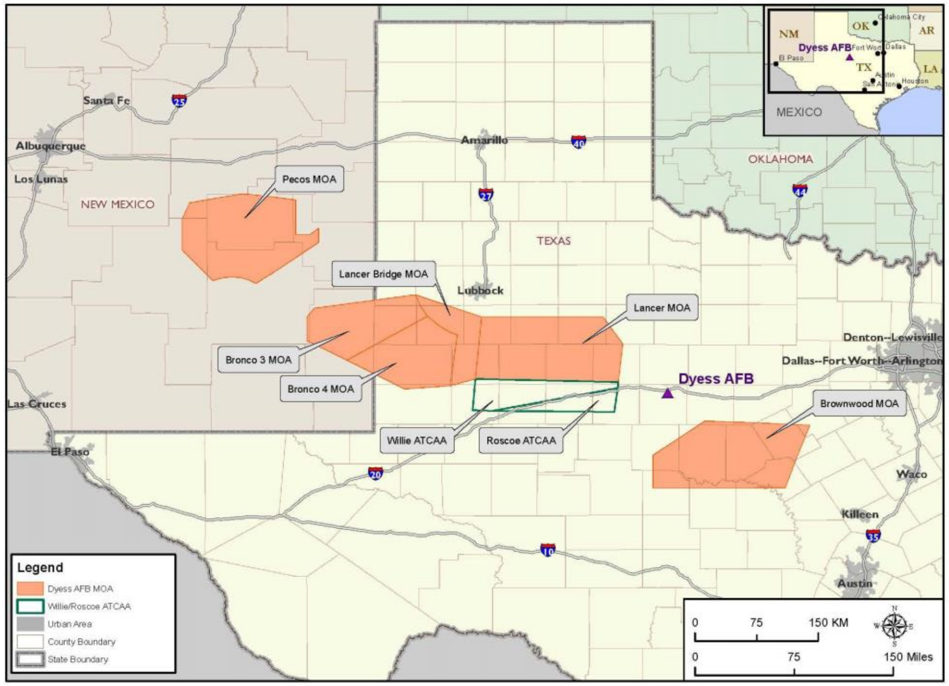
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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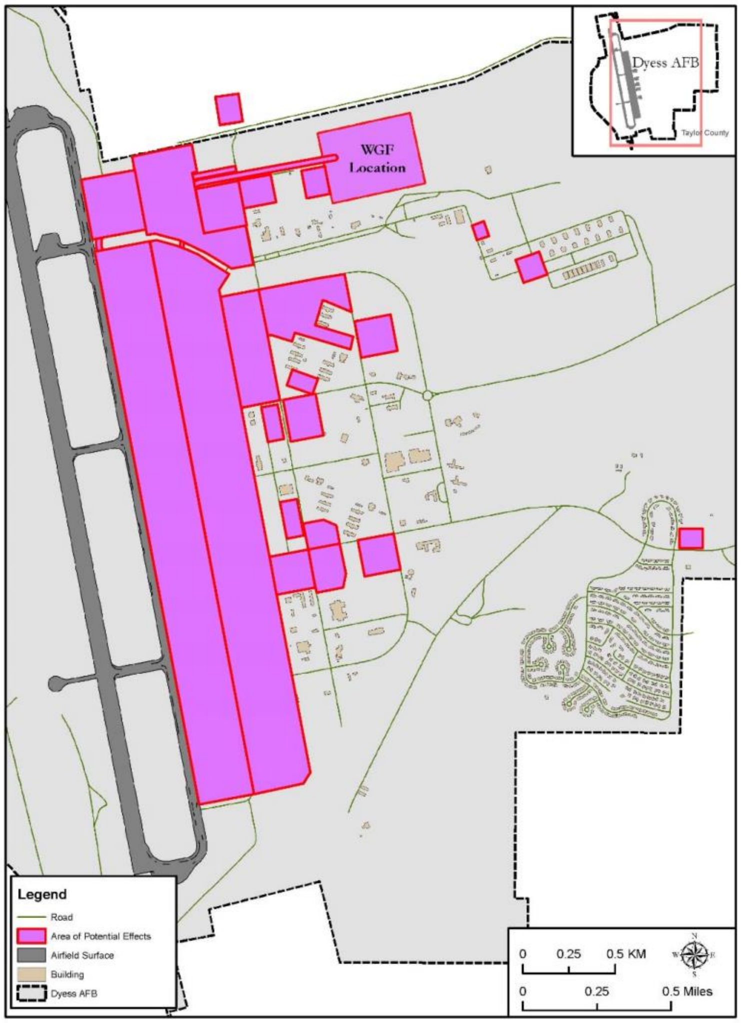

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Jeff Haozous, Chairman
Fort Sill Apache Tribe of Oklahoma
43187 U.S. Hwy 281
Apache OK 73006

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Haozous

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

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I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Fort Sill Apache Tribe of Oklahoma. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Fort Sill Apache Tribe of Oklahoma on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
Bldg. 4111	7,089	Demolition
Bldg. 4112	5,792	Demolition
Bldg. 4119	3,382	Demolition
Bldg. 4160	1,358	Demolition
Bldg. 4217	15,875	Demolition
Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
Note:
a. The National Airborne Operations Center Support facility is not part of the B-21 program but is a connected action as a result of displacement due to the beddown of the B-21.

The APE for this undertaking is therefore defined as the planned facilities and infrastructure projects described in **Error! Reference source not found.** and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations.

Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

The Fort Sill Apache Tribe of Oklahoma has determined that:

- ☐ There is a potential for significant sites to the Fort Sill Apache Tribe of Oklahoma would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Fort Sill Apache Tribe of Oklahoma are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Fort Sill Apache Tribe of Oklahoma are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Fort Sill Apache Tribe of Oklahoma are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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Phone: ______________________________

E-mail: ______________________________

Signature: ____________________________

Date: _______________________________

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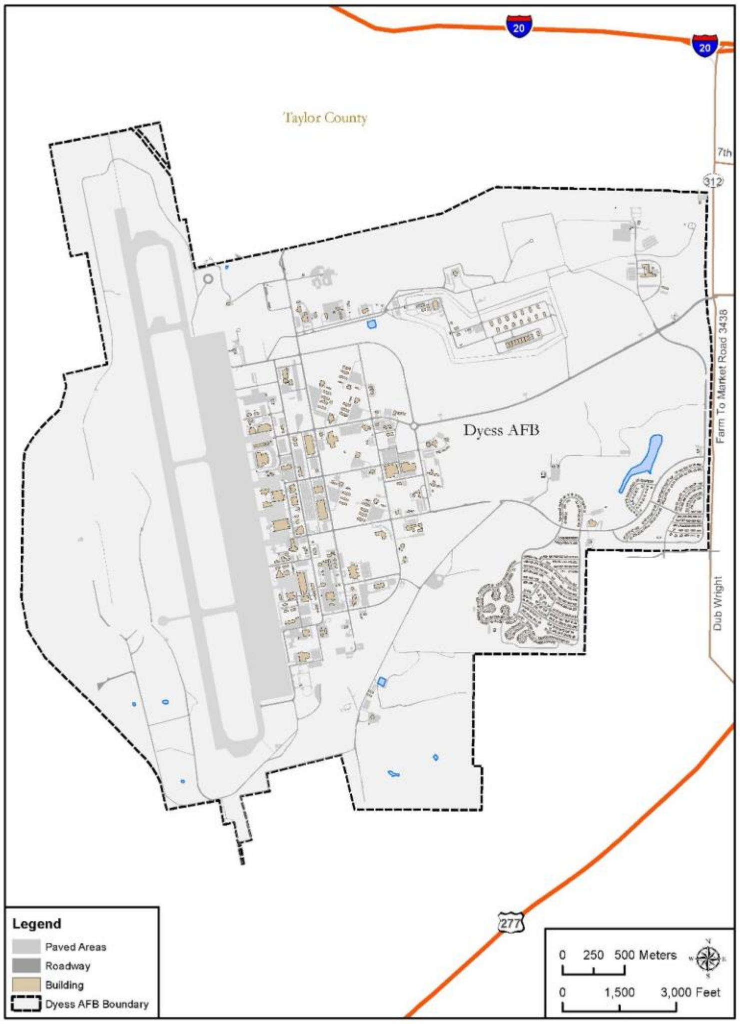
Attachment 1 – Dyess AFB Location



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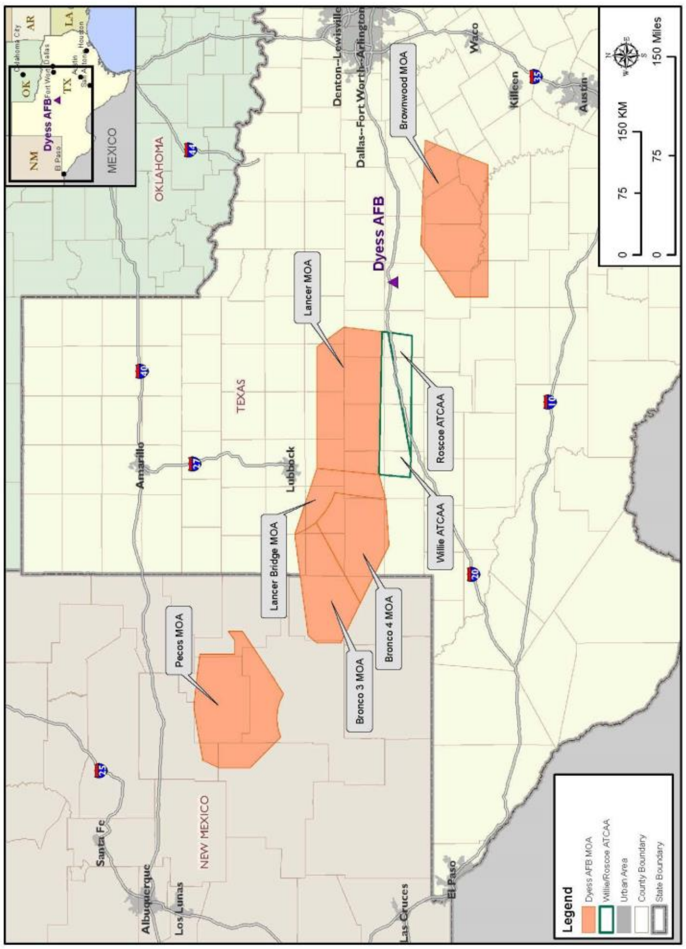
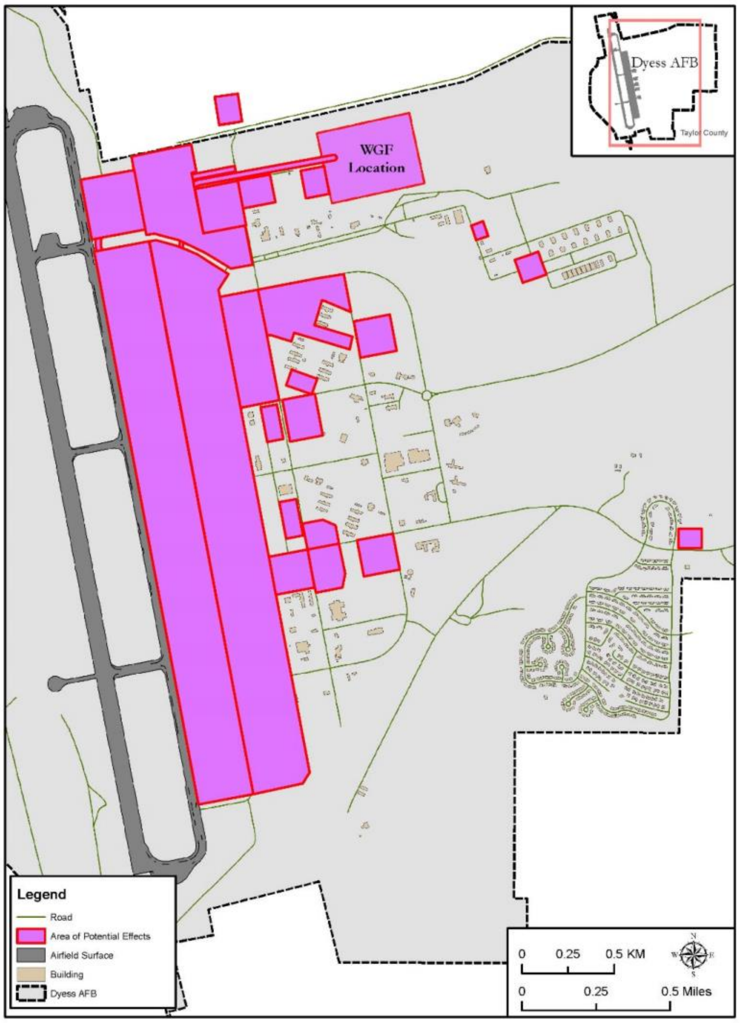
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Donnie Garcia, Chairman
Jicarilla Apache Nation
P.O. Box 507
Dulce NM 87528

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Garcia

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Jicarilla Apache Nation. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Jicarilla Apache Nation on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
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B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
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77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

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Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

The Jicarilla Apache Nation has determined that:

- ☐ There is a potential for significant sites to the Jicarilla Apache Nation would like to visit/investigate.

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Name/Title of designated contact for this proposed project:

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Phone: ______________________________

E-mail: ______________________________

Signature: ____________________________

Date: ________________________________

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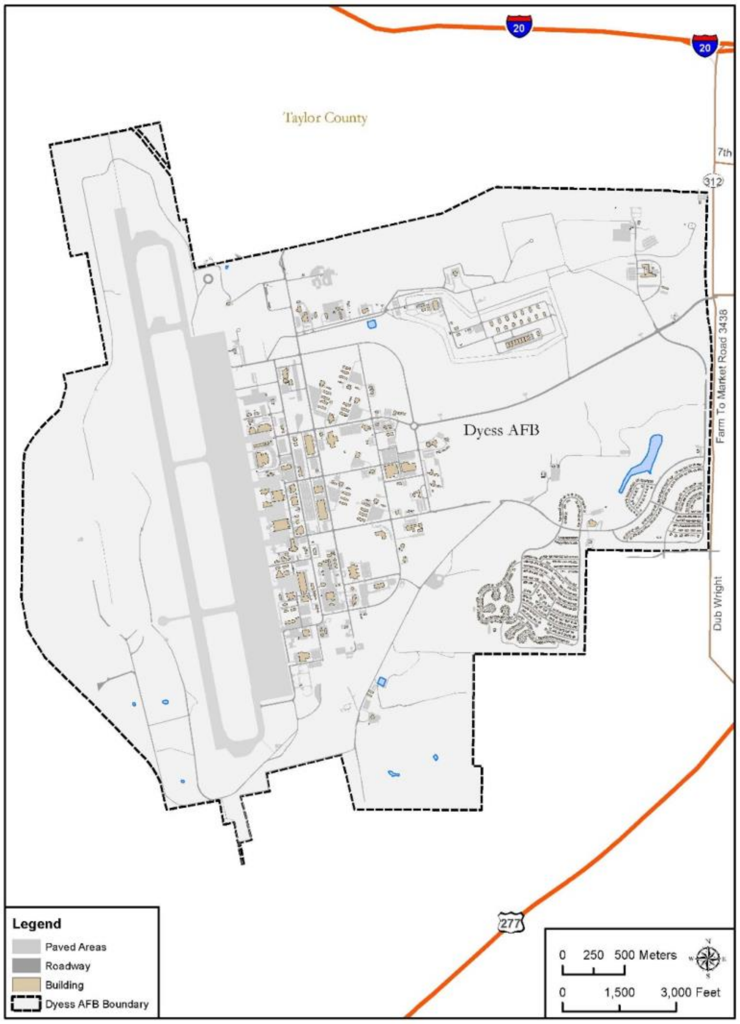

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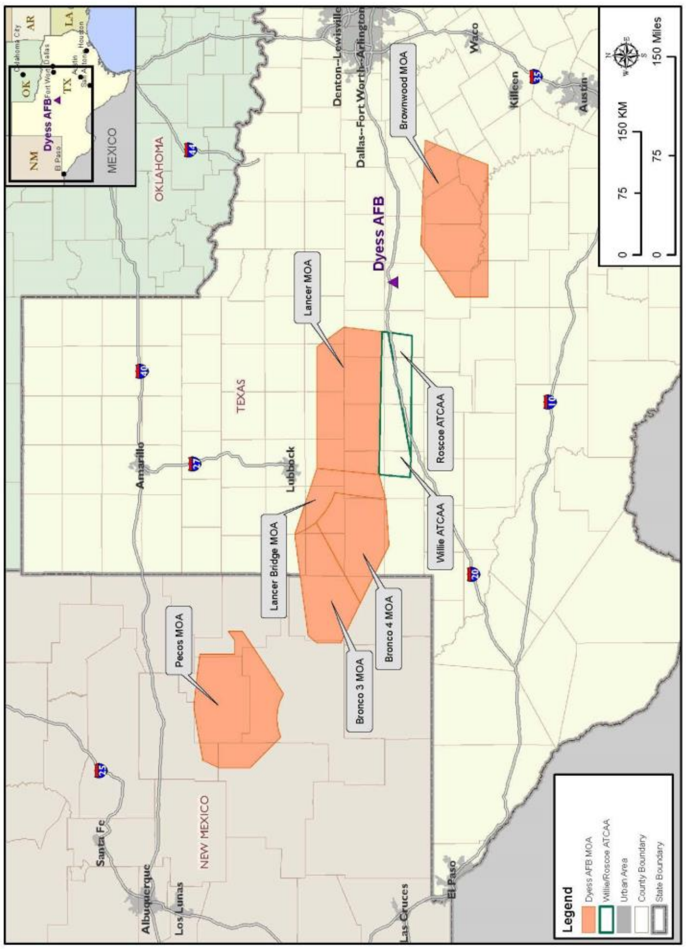
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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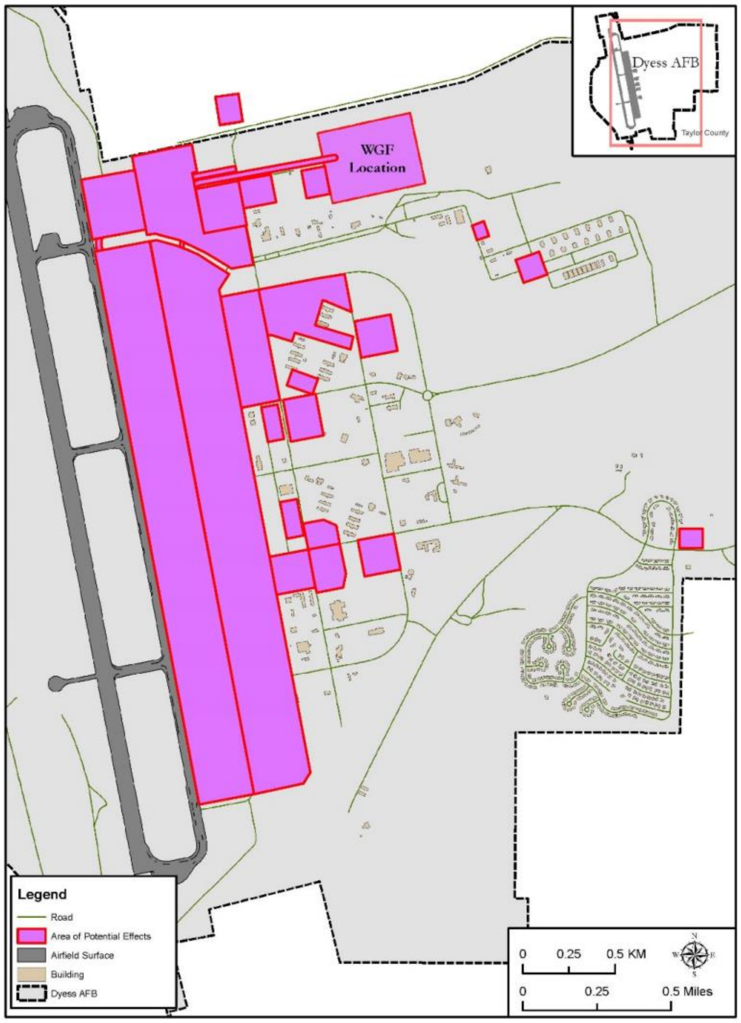
Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Juan Garza Jr., Chairman
Kickapoo Traditional Tribe of Texas
2212 Rosita Valley Road
Eagle Pass TX 78852

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Garza Jr.

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Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

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The Kickapoo Traditional Tribe of Texas has determined that:

- ☐ There is a potential for significant sites to the Kickapoo Traditional Tribe of Texas would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Kickapoo Traditional Tribe of Texas are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Kickapoo Traditional Tribe of Texas are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Kickapoo Traditional Tribe of Texas are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

____

Phone: ____________________________________

E-mail: ____________________________________

Signature: ___________________________________

Date: ______________________________________

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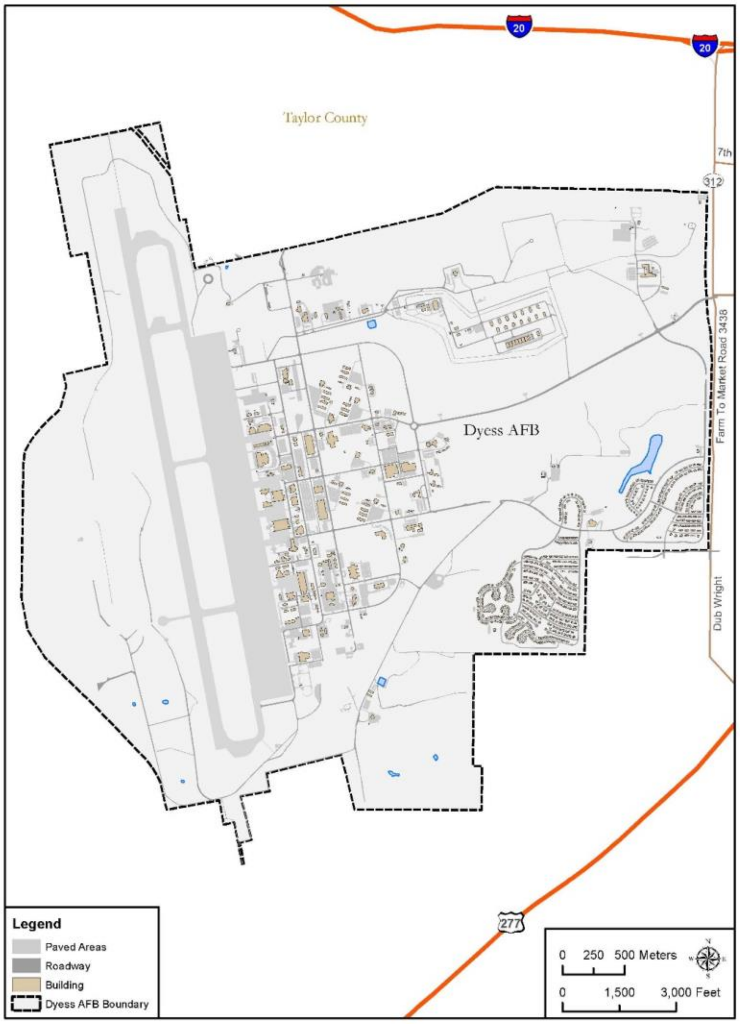
Attachment 1 – Dyess AFB Location



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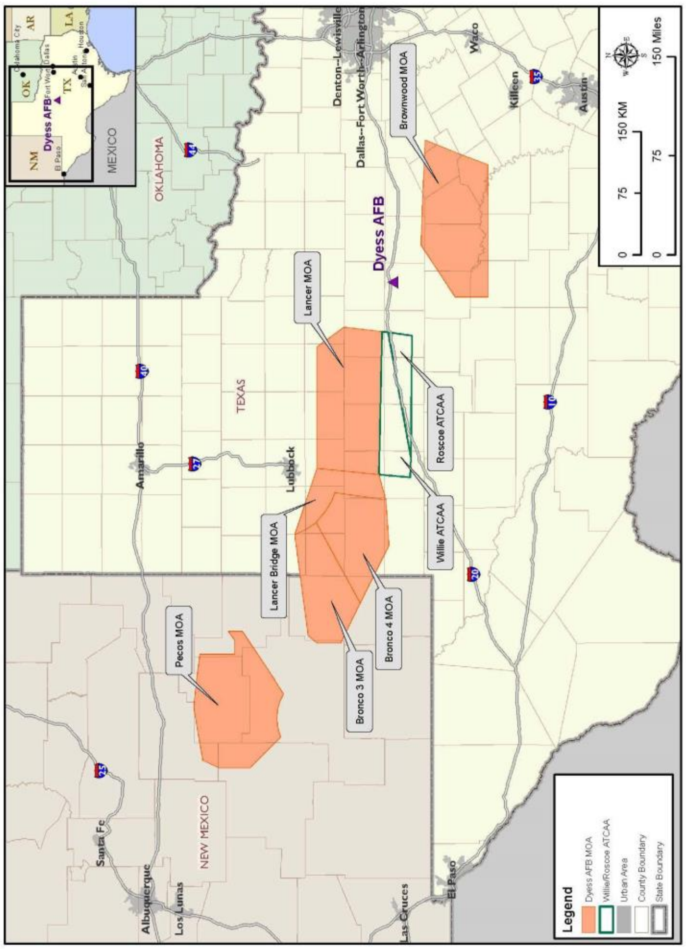
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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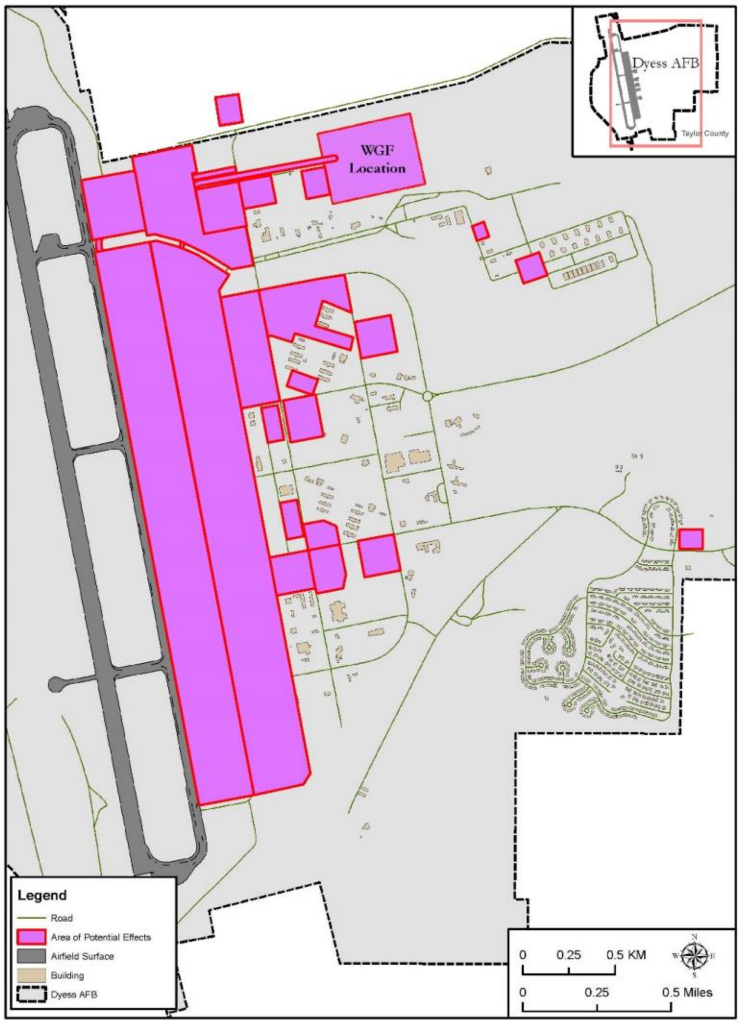
Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Matthew Komalty, Chairman
Kiowa Tribe of Oklahoma
P.O. Box 369
Carnegie OK 73015

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Chairman Komalty

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Kiowa Tribe of Oklahoma. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

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This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
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Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
Note:
a. The National Airborne Operations Center Support facility is not part of the B-21 program but is a connected action as a result of displacement due to the beddown of the B-21.

The APE for this undertaking is therefore defined as the planned facilities and infrastructure projects described in **Error! Reference source not found.** and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations.

Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

5

The Kiowa Tribe of Oklahoma has determined that:

- ☐ There is a potential for significant sites to the Kiowa Tribe of Oklahoma would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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Phone: ___________________________________

E-mail: ___________________________________

Signature: ________________________________

Date: _____________________________________

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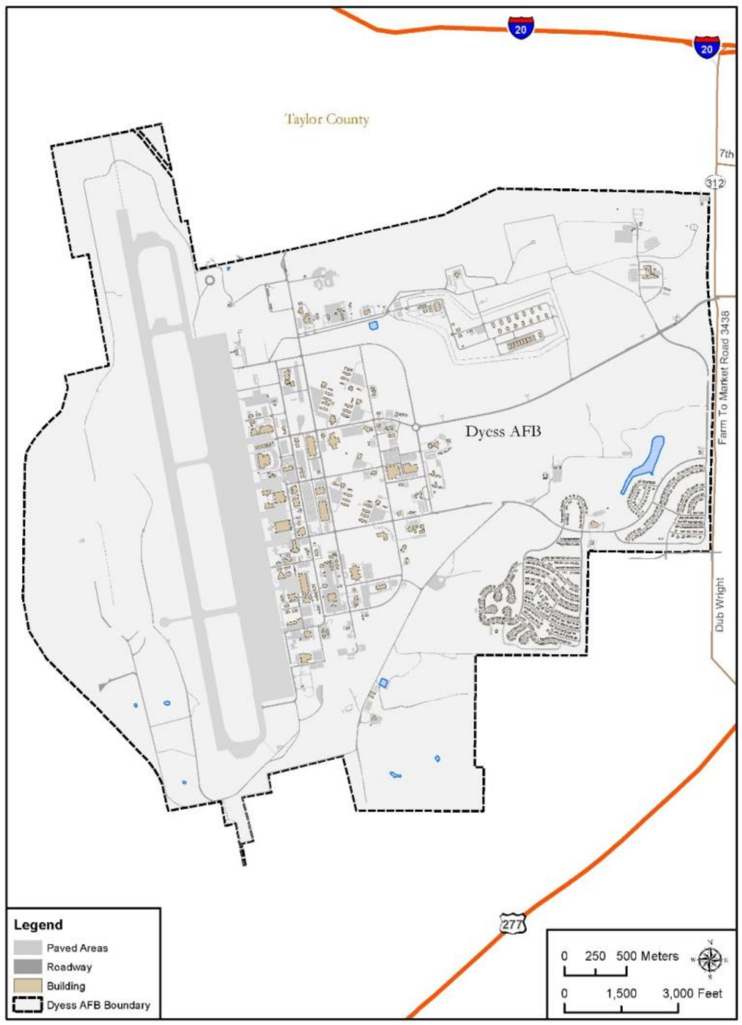
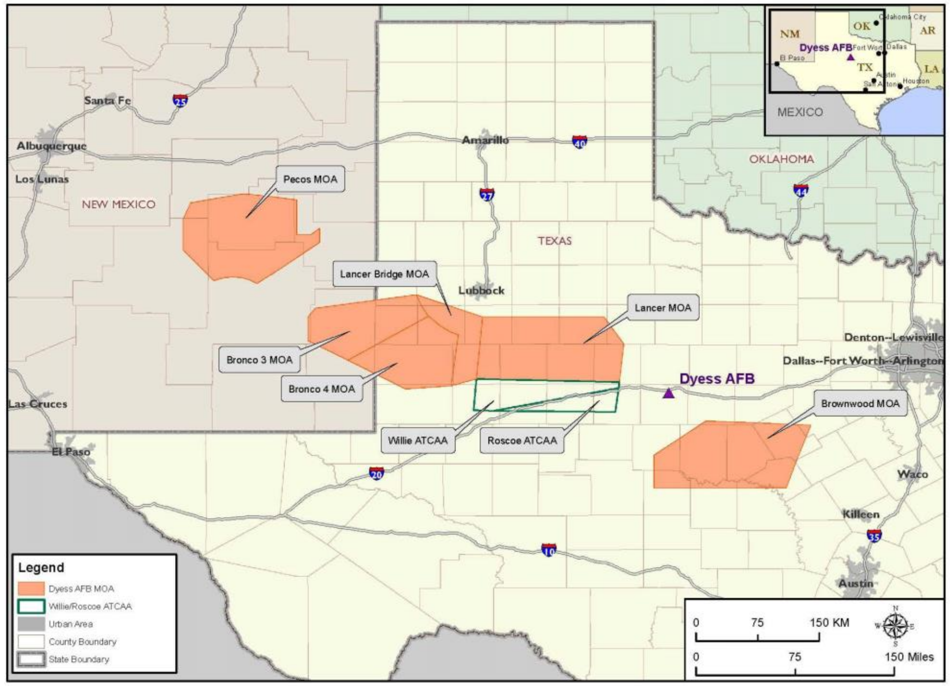


Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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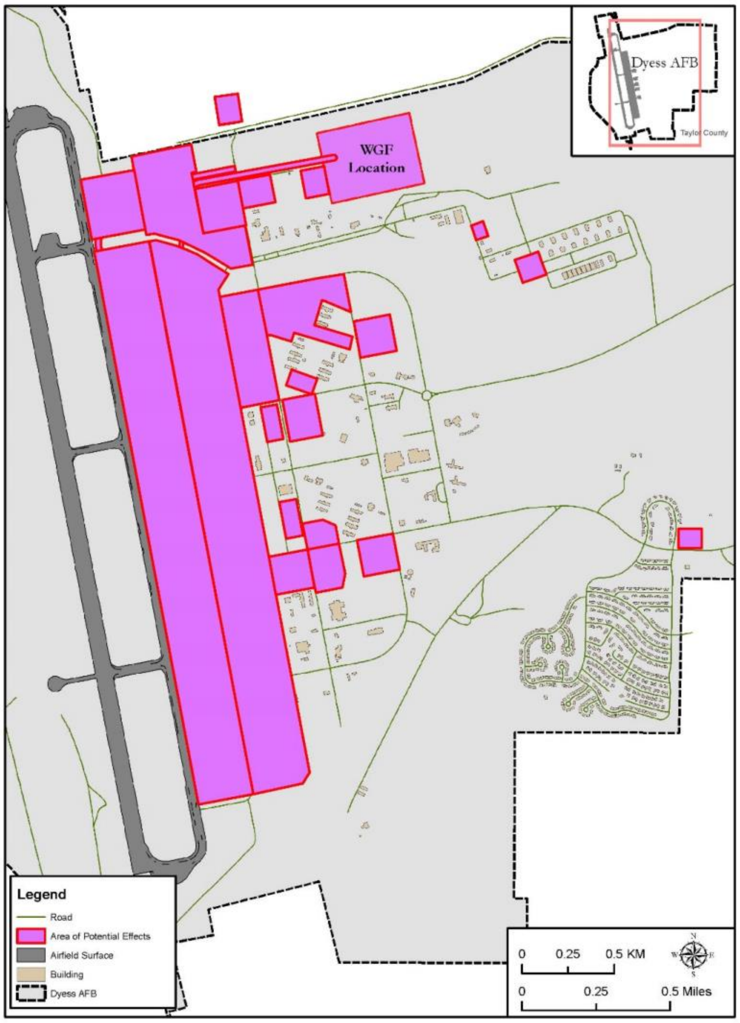

DEPARTMENT OF THE AIR FORCE
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DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Gabe Aguilar, President
Mescalero Apache Tribe
P.O. Box 227
Mescalero NM 88340

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear President Aguilar

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Name/Title of designated contact for this proposed project:

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Phone: ___________________________________

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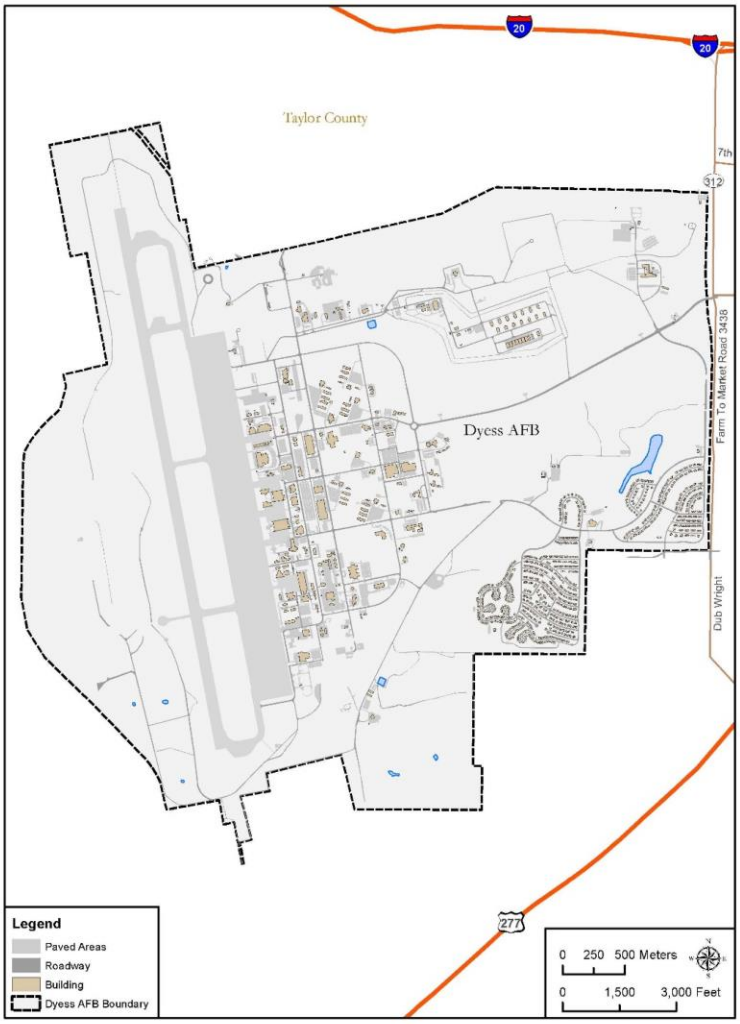

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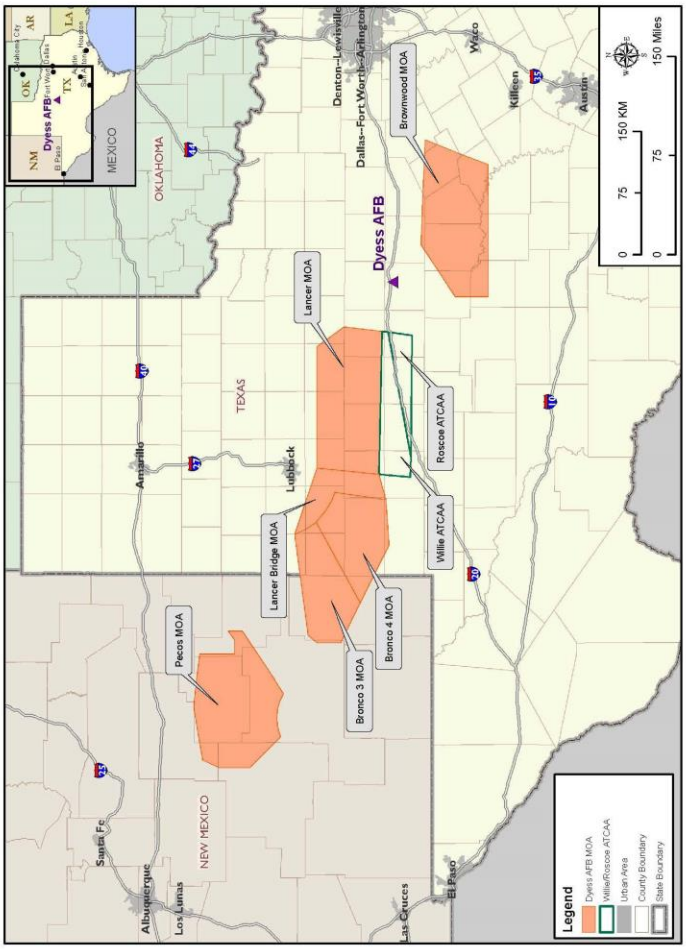

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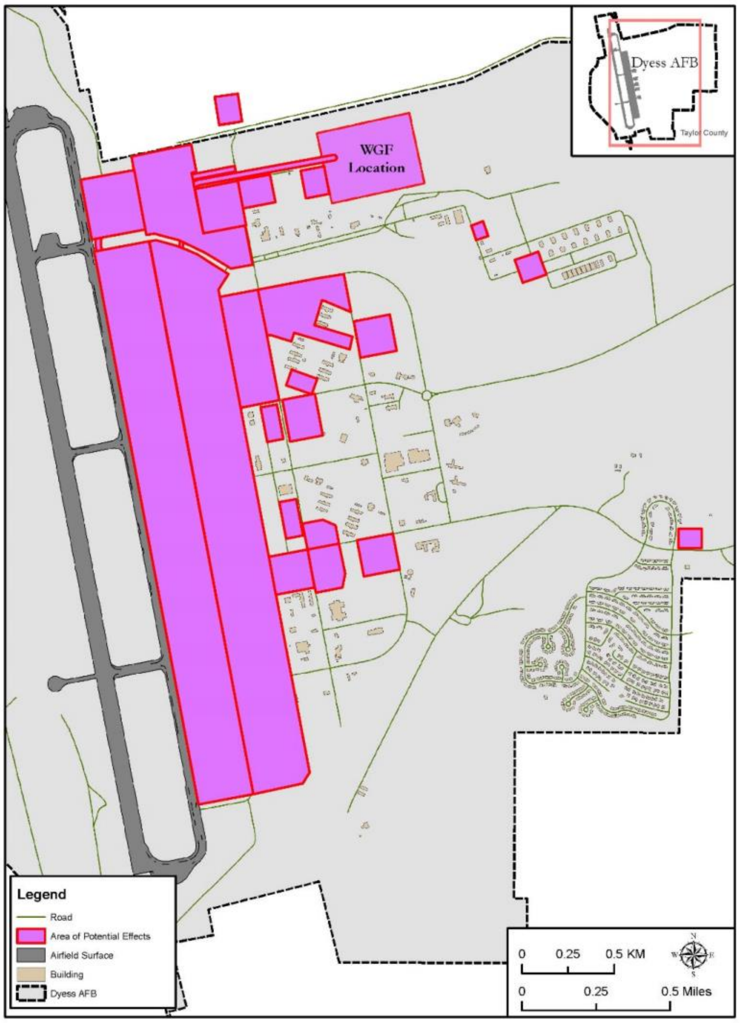

DEPARTMENT OF THE AIR FORCE
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DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Russell Martin, President
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Rd.
Tonkawa OK 74653

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

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- ☐ There is a potential for significant sites to the Tonkawa Tribe of Indians of Oklahoma would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Tonkawa Tribe of Indians of Oklahoma are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Tonkawa Tribe of Indians of Oklahoma are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Tonkawa Tribe of Indians of Oklahoma are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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Phone: ___________________________________

E-mail: ___________________________________

Signature: ________________________________

Date: _____________________________________

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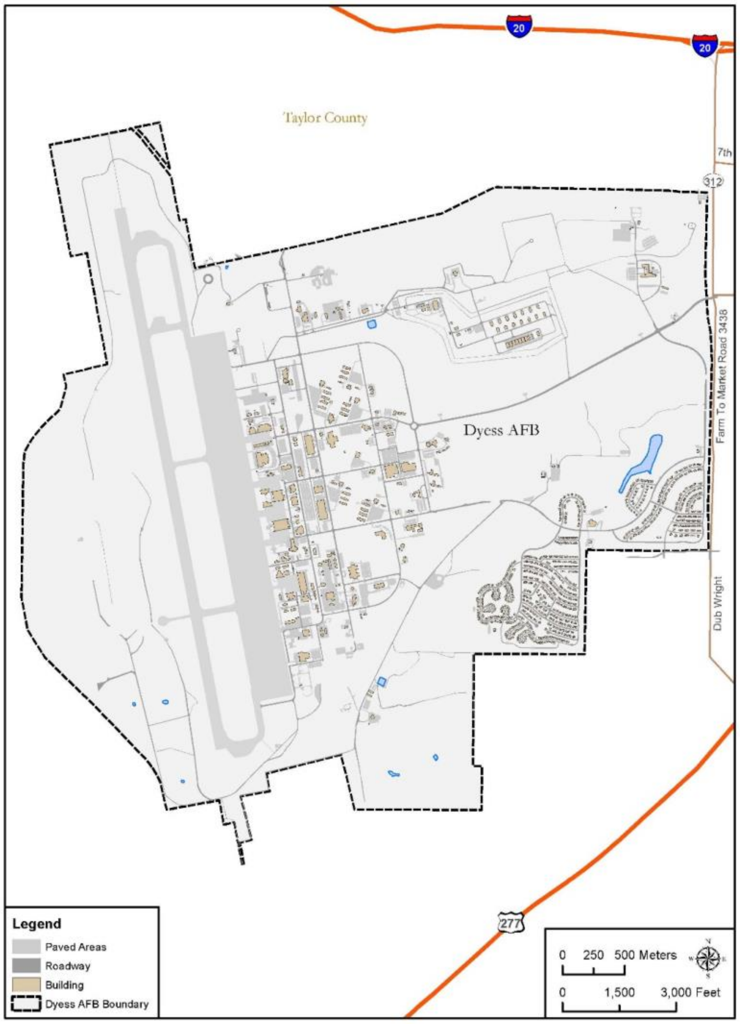
Attachment 1 – Dyess AFB Location



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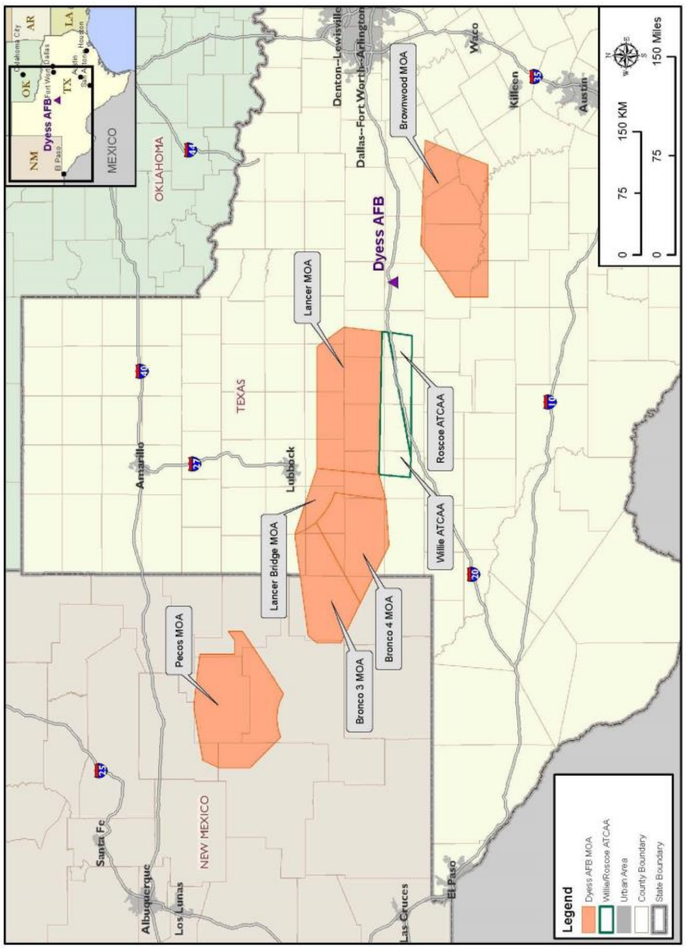
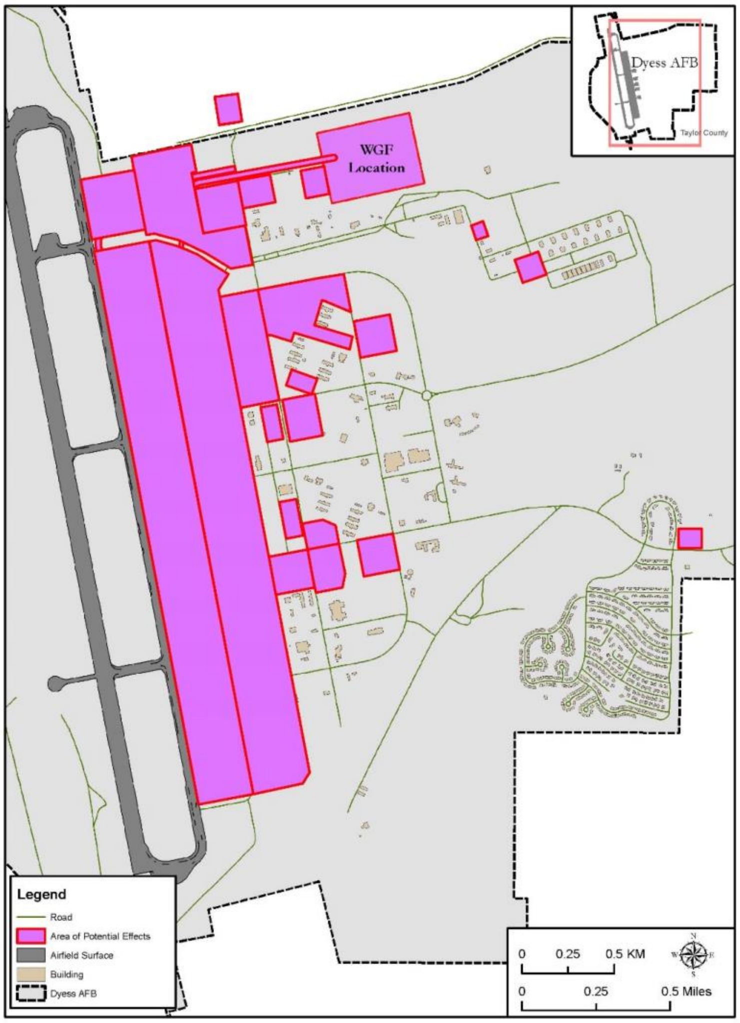
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Terri Parton, President
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko OK 73005

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear President Parton

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Wichita and Affiliated Tribes. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Wichita and Affiliated Tribes on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

DEATH FROM ABOVE

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This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
Bldg. 4111	7,089	Demolition
Bldg. 4112	5,792	Demolition
Bldg. 4119	3,382	Demolition
Bldg. 4160	1,358	Demolition
Bldg. 4217	15,875	Demolition
Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
Note:
a. The National Airborne Operations Center Support facility is not part of the B-21 program but is a connected action as a result of displacement due to the beddown of the B-21.

The APE for this undertaking is therefore defined as the planned facilities and infrastructure projects described in **Error! Reference source not found.** and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations.

Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

The Wichita and Affiliated Tribes has determined that:

- ☐ There is a potential for significant sites to the Wichita and Affiliated Tribes would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Wichita and Affiliated Tribes are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Wichita and Affiliated Tribes are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
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- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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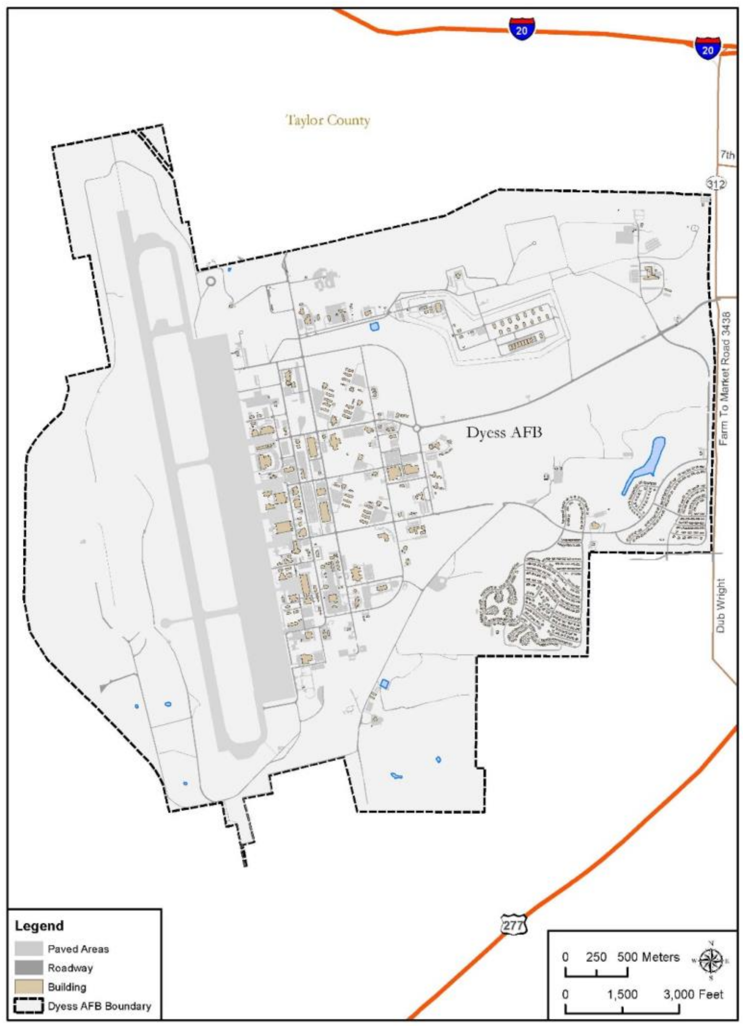
Phone: ____________________________________

E-mail: ____________________________________

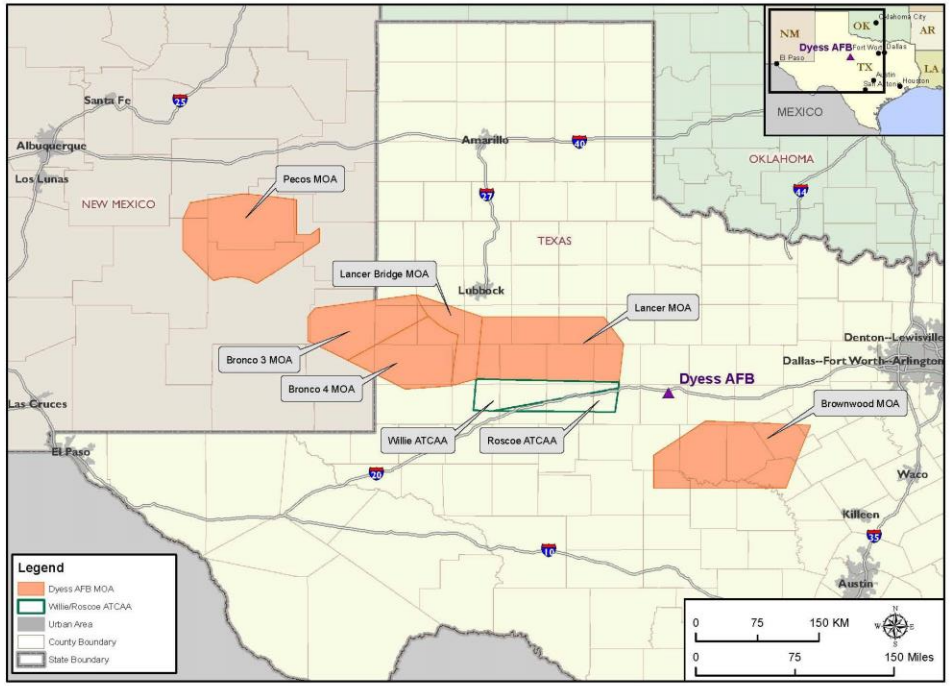
Signature: __________________________________

Date: ______________________________________

Attachment 1 – Dyess AFB Location



Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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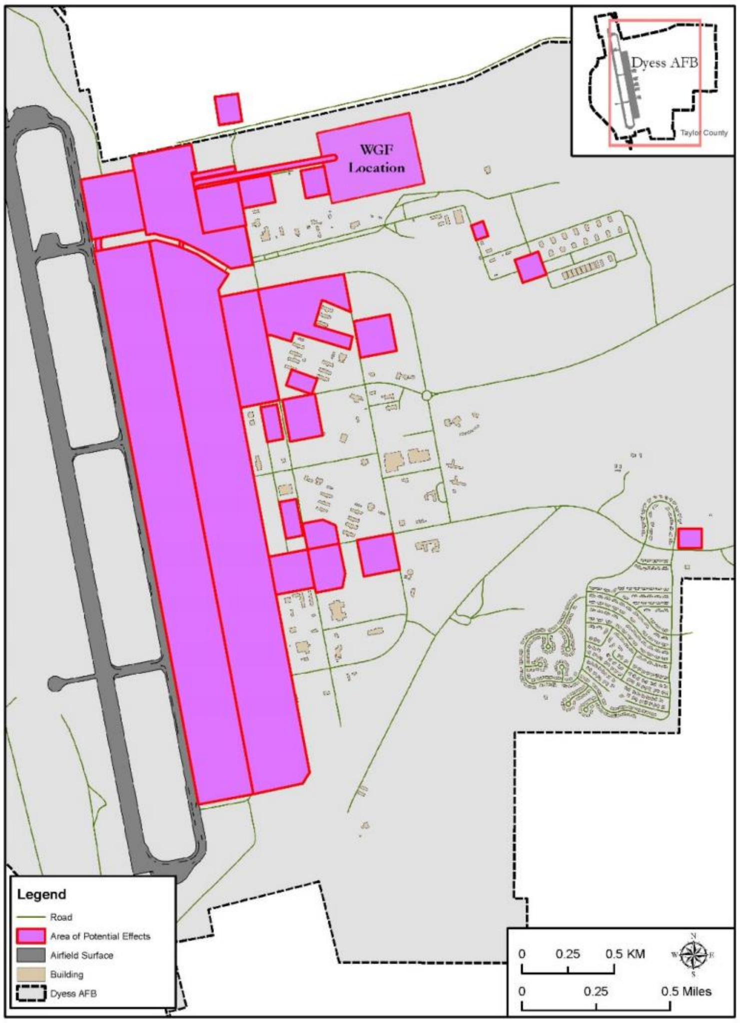

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

E. Michael Silvas, Governor
Ysleta Del Sur Pueblo
P.O. Box 17579
El Paso TX 79907

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Governor Silvas

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri.

Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental and cultural concerns and engaging early with tribal governments as it formulates the undertaking.

I ask for your assistance in identifying any such religious, cultural or historic properties on Dyess AFB and within the project's Area of Potential Effects (APE, described below) that may be of significance to the Ysleta Del Sur Pueblo. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

To date, no traditional cultural properties have been identified on base. Dyess AFB does not know of any historic properties of religious and cultural significance to the Ysleta Del Sur Pueblo on the installation. Nevertheless, we ask for your assistance identifying any historic properties we may be unaware, particularly those which may be affected by the proposed undertaking described below.

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Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
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Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

JK.Kerr

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction – Dyess AFB

5

The Ysleta Del Sur Pueblo has determined that:

- ☐ There is a potential for significant sites to the Ysleta Del Sur Pueblo would like to visit/investigate.
- ☐ Historic properties of religious and cultural significance to the Ysleta Del Sur Pueblo are not present on Dyess AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Ysleta Del Sur Pueblo are present on Dyess AFB, but consultation is not required at this time because the properties will not be affected by the B-21 Main Operating Base 1 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ Historic properties of religious and cultural significance to the Ysleta Del Sur Pueblo are present on Dyess AFB or within the project's APE, and the tribe desires to consult on these and future projects.
- ☐ Additional comments or concerns may be written below or by separate attachment:

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Name/Title of designated contact for this proposed project:

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Phone: ______________________________

E-mail: ______________________________

Signature: ___________________________

Date: ______________________________

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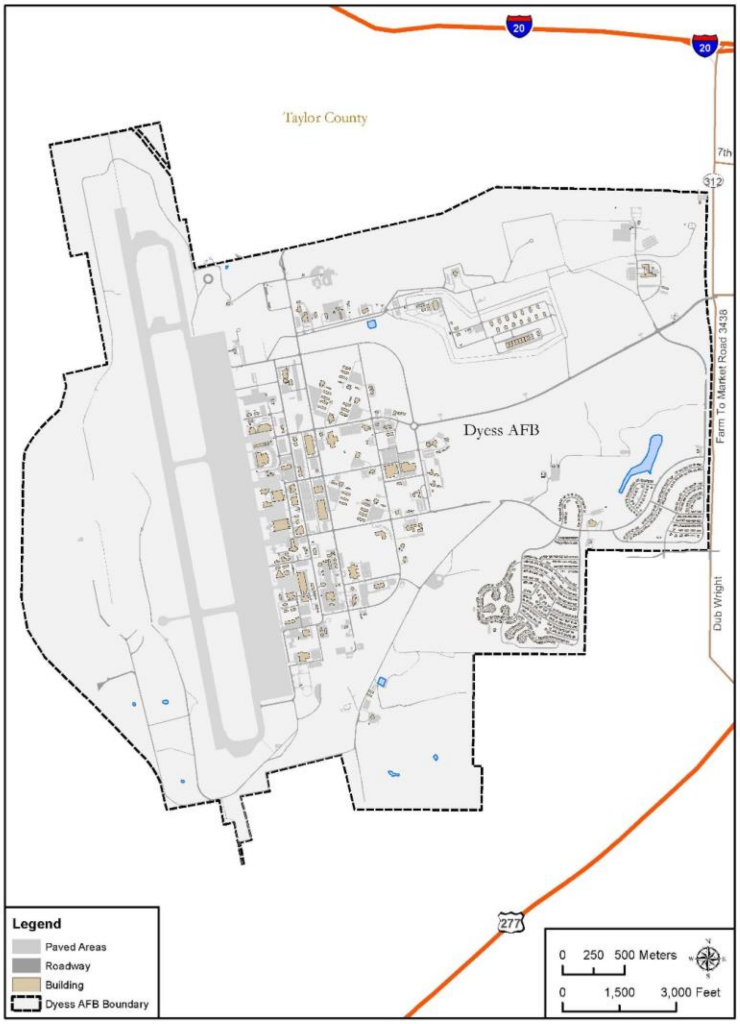
Attachment 1 – Dyess AFB Location



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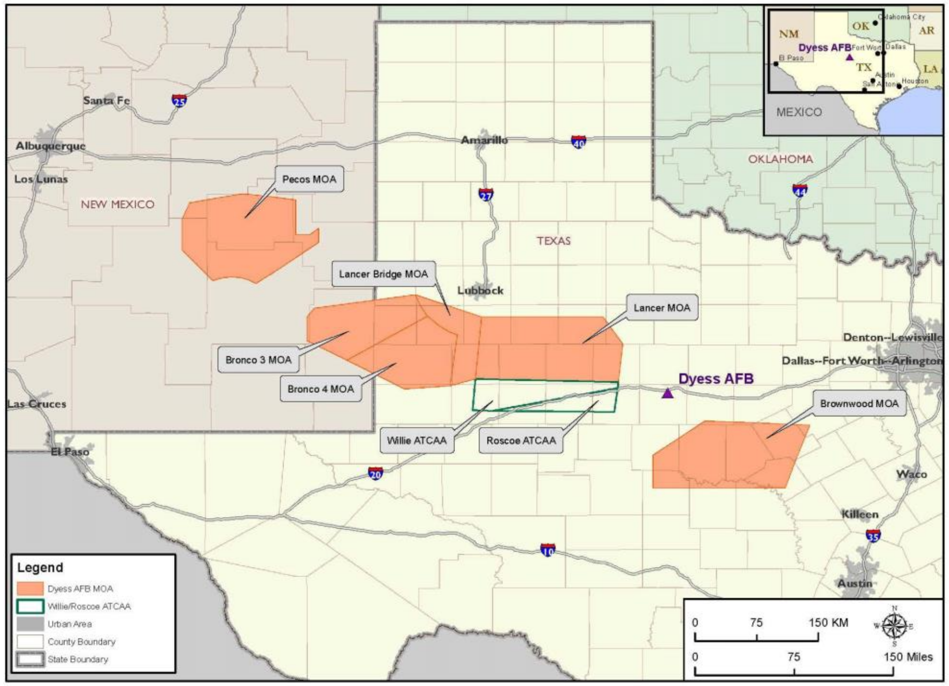
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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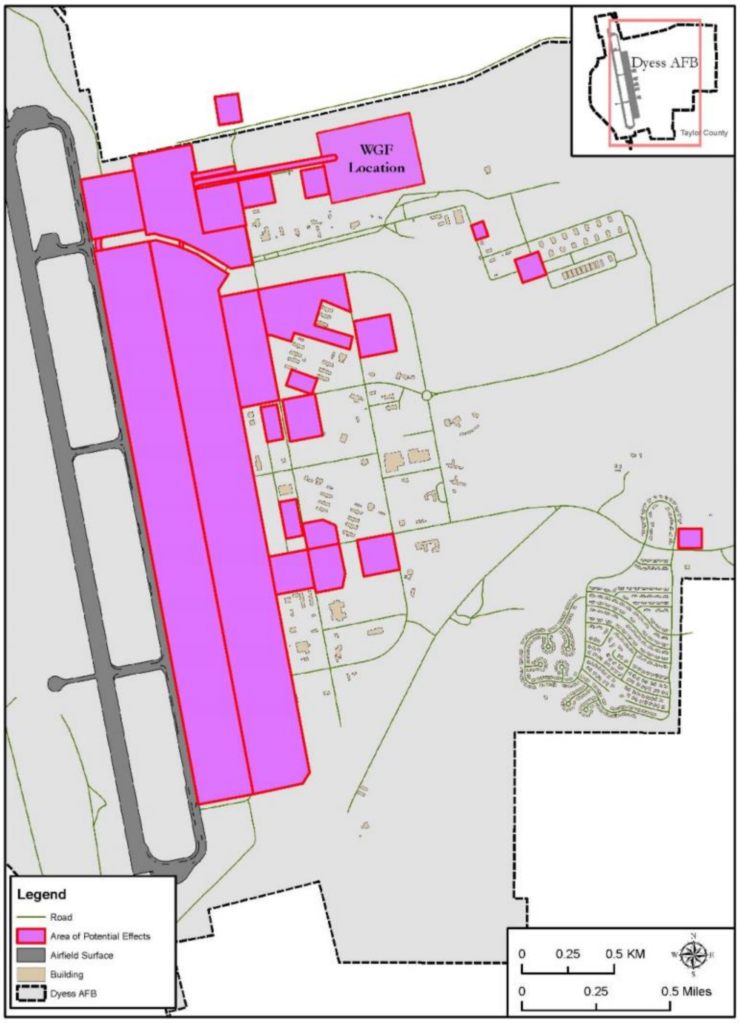
Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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E.1.1.1 Tribal Responses

From: Jonathan Rohrer <noreply@jotform.com>
Sent: Friday, July 28, 2023 11:29 AM
To: FOREMAN, BRYAN W CIV USAF AFGSC 7 CES/CENP <bryan.foreman@us.af.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base(AFB), Texas, or Whiteman AFB, Missouri -

Bryan

Thank you for your request for consultation, received on 07-24-2023. The Caddo Nation appreciates your willingness to conduct proper consultation, pursuant to Section 106 of the National Historic Preservation Act.

Upon review of the project and location I have determined that it does not affect known cultural, traditional or sacred sites of interest to the Caddo Nation. As such, the Caddo Nation has no objection to the project at this time. However, in the event that an inadvertent discovery of potentially relevant cultural sites, funerary objects, or human remains occurs, we request that the project be immediately halted and the proper authorities be contacted. Additionally, The Caddo Nation would need to be notified of an inadvertent discovery with 24 hours.

Should you have any question or concerns regarding this response please feel free to contact our office.

Best regards,

Jonathan

Jonathan M. Rohrer
Tribal Historic Preservation Officer
Caddo Nation

Caddo Nation
P.O. Box 487
Binger, OK 73009
t: (405)656-0970 Ext. 2070
e: jrohrer@mycaddonation.com

www.mycaddonation.com

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E.1.2 Whiteman Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

10 July 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Suite 116
Whiteman AFB MO 65305

Dr. Andrea Hunter, Ph.D., THPO/Director
Osage Nation
627 Grandview
Pawhuska OK 74056

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Director Hunter

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) (NHPA) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF is accounting for various environmental concerns and engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEFEND...AVENGE!

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Whiteman AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,000 personnel and airfield operations are expected to increase by approximately 2,000 operations. For military aircraft flying out of Whiteman AFB, Smoky Hill Range (Smoky Military Operating Area [MOA], Bison MOA and R-3601A/B), Cannon MOA (A and B), and Ada MOA (East and West), including all associated ATCAAs, as well as the Ozark ATCAA (A, B, and C) would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 600,000 square feet (sf) of construction, 1.7 million sf of renovation, and 85,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Whiteman AFB Alternative

Facility	Size (Square Feet)	Building Type
Field Training Detachment	34,399/20,000	Renovation/Addition (Bldg. 152)
Field Training Detachment Parking Area	47,916	New
Radio Frequency Hangar	57,532	New
Armament Shop (Weapons Release & Suspension Shop)	7,500/17,000	Renovation/Addition (Bldg. 5208)
Weapons Load Trainer (2-Bay)	60,225	New
Hangar 4	29,225	Demolition
Cockpit Procedure Trainer	29,383 5,000	Demolition (Bldg. 706) New
Chadwell Cockpit Procedure Trainer	5,000	New
Special Access Program Space	38,209	Renovation (Bldg. 509)
Simulator Facility (Phase 1)	92,511	Renovation (Bldg. 153)
Simulator Facility (Phase 2)	92,511	Renovation (Bldg. 153)
Low Observable Hangar (2-Bay)	81,776	Renovation (Bldg. 5205/5206)
Low Observable Equipment Facility	8,000	New
Snow Removal Areas	100,000	New
Base Supply Warehouse	106,588	Renovation (Bldg. 139)

Table 1. Facilities and Infrastructure for the Whiteman AFB Alternative

Facility	Size (Square Feet)	Building Type
Aircraft Maintenance Unit Composite Tool Kit	37,258	Renovation (Bldg. 14)
Phase Dock (2-Bay)	148,407	Renovation (Bldg. 9)
General Maintenance Hangars (14)	26,500 x 14 = 371,000	Renovation (Docks 1–14)
Aircraft Maintenance Units 1 & 2	40,617	Renovation (Bldg. 33)
Wash Rack Hangar	31,837	Renovation (Bldg. 27)
Aircraft Parts Store	16,965	Renovation (Bldg. 26)
Fuel Cell Hangar	30,474	Renovation (Bldg. 1)
Operations Overflow	33,147	Renovation (Bldg. 200)
Environmental Shelters (11)	21,400 x 11 = 235,400	New (on Existing Pavement)
Roads/Road Access	91,191	New
Bldg. 43	26,393	Demolition
Petroleum, Oil, and Lubricant Operations	4,183/1,687	Renovation/Addition (Bldg. 90)
Petroleum, Oil, and Lubricant Parking	4,500	Addition
Storage/Maintenance	24,742	Renovation (Hangar 52)
Hazardous Materials Pharmacy	8,683/4,000	Renovation/Addition (Bldg. 114)
Maintenance Facility	39,917	Renovation (Bldg. 7)
Propulsion Shop	24,084	Renovation (Bldg. 2)
Mobility Warehouse	23,732	Renovation (Bldg. 115)
Combined Operations Building	79,190	Renovation (Bldg. 38)
Low Observable Supply Building	2,770	Renovation (Bldg. 5214)
Intermediate Maintenance Facility	68,941	Renovation (Bldg. 4055)
Aircrew Flight Equipment	5,203	Renovation (Bldg. 32)
Engine Test Cell	4,479	Renovation (Bldg. 5203)
BOS – Dorm (144-Person Occupancy; Three Stories)	119,985	New
BOS – Child Development Center	8,000	Addition
BOS – Youth Center	8,387	Addition
BOS – Fitness Center	33,500	Addition
BOS – Dining Facility	4,000	Addition

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Suppor

The WGF is a facility that is unique to the B-21 mission and would require new construction at the selected base. The WGF will provide a safer and more secure location for the storage of DAF munitions, both conventional and unconventional. The final WGF compound size will be approximately 20 acres. The WGF compound would be double-fenced (approximately 7,100 linear feet), with approximately 8 acres of construction, consisting of 81,620 sf of facilities and 274,814 sf of parking/pavement areas. Due to national security implications, the details regarding the infrastructure associated with the WGF is not releasable to the public.

DAF planners identified five possible locations at Whiteman AFB for the WGF. Attachment 3 illustrates the five possible sites assessed by DAF planners, including the two preferred locations. After applying the planning process, the DAF eliminated three locations.

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Location 1 was eliminated because of impacts to current missions, including limiting potential future capabilities of the 442 FW weapons storage area, security related issues, and weapons safety concerns. Location 4 was eliminated due to site constraints that would limit potential future capabilities of the weapons storage area, in addition to impacts to current missions. Location 5 was eliminated due to site constraints associated with airfield criteria and proximity to existing infrastructure and would interfere with navigational aids, create access issues for the existing docks and would require access to the airfield to get to the WGF. Therefore, Locations 2 and 3 were selected as proposed locations because they satisfied the site evaluation criteria unique to the WGF. Location 2 is hereafter referred to as the North WGF Site and Location 3 is the South WGF Site.

The Area of Potential Effects (APE) for this undertaking is therefore defined as the planned facilities and infrastructure projects described in Table 1 and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Whiteman AFB, no significant changes to auditory, vibration, or aesthetic effects would be anticipated from future aircraft operations.

I ask for your assistance in identifying any such religious, cultural or historic properties on Whiteman AFB and within the project's APE that may be of significance to the Osage Nation. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures evaluated as eligible for or listed on the NRHP.

There are no historic properties on base within the APE eligible for or listed in the NRHP.To date, no traditional cultural properties have been identified on base. Whiteman AFB does not know of any historic properties of religious and cultural significance to the Osage Nationon the installation. Nevertheless, we ask for your assistance identifying any historic properties of which we may be unaware, particularly those which may be affected by the proposed undertaking described above.

Please indicate below in the attached questionnaire whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Mr. Chris Moore (AFCEC/CZN), AFCEC Point of Contact at 512.417.3715 or by email at christopher.moore.114@us.af.mil. Thank you in advance for your assistance in this effort.

Sincerely

KEITH J. BUTLER, Colonel, USAF
Commander

Attachments:
Attachment 1 Whiteman AFB Location
Attachment 2 Whiteman AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction Whiteman AFB

6

Section 106 Consultation Questionnaire

Project Name: B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri Environmental Impact Statement (EIS)

Please check the appropriate response(s) from the list below and use the back of the form or additional sheets if you wish to make comments. You may also respond via e-mail or phone to Mr. Chris Moore, AFCEC point of contact at 512.417.3715 or christopher.moore.114@us.af.mil.

- ☐ Historic properties of religious and cultural significance to the Osage Nation are not present on Whiteman AFB or within the project's APE, and therefore consultation is not required at this time.
- ☐ Historic properties of religious and cultural significance to the Osage Nation are present on Whiteman AFB, but consultation is not required at this time because the properties will not be affected by the proposed B-21 Main Operating Base 2 Beddown at Dyess AFB, Texas, or Whiteman AFB, Missouri.
- ☐ There are or may be issues of concern associated with this proposed project and we wish to be included as a Section 106 Consulting Party. We prefer:

_______ Meeting with the Air Force at a tribal facility.

_______ Communicating with the Air Force by scheduled teleconference.

Additional comments or concerns may be written below or by separate attachment:

____
____
____
____
____

Name/Title of designated contact for this proposed project:

_________________________________ _________________________________

Phone: _________________________________

E-mail: _________________________________

Signature: _________________________________

Date: _________________________________

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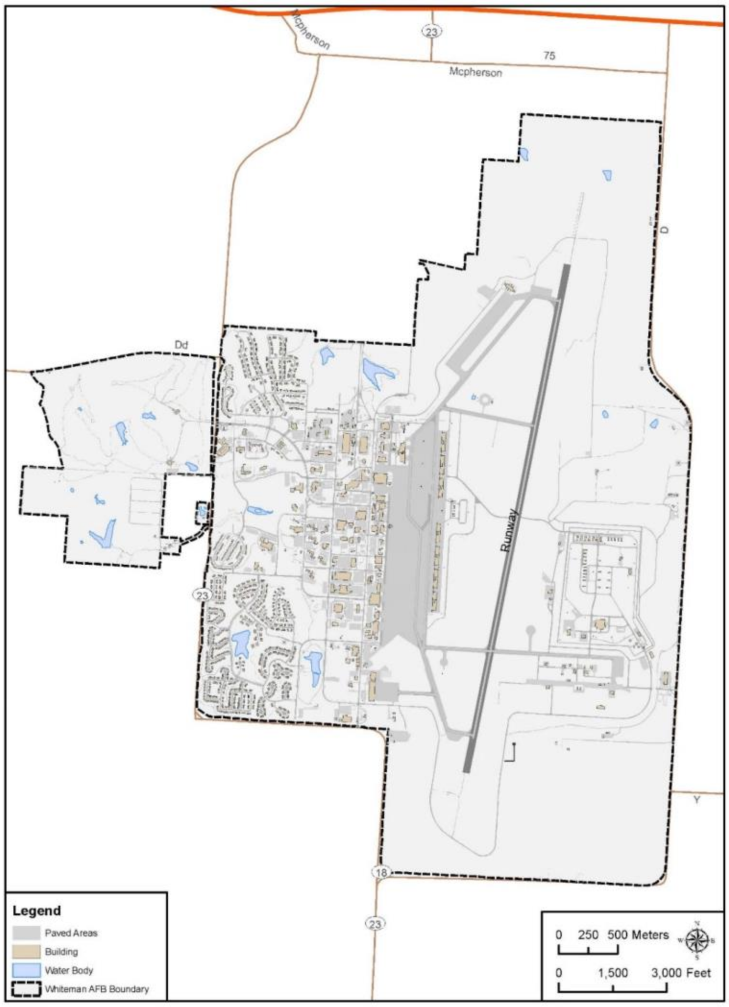
Attachment 1 – Whiteman AFB Location



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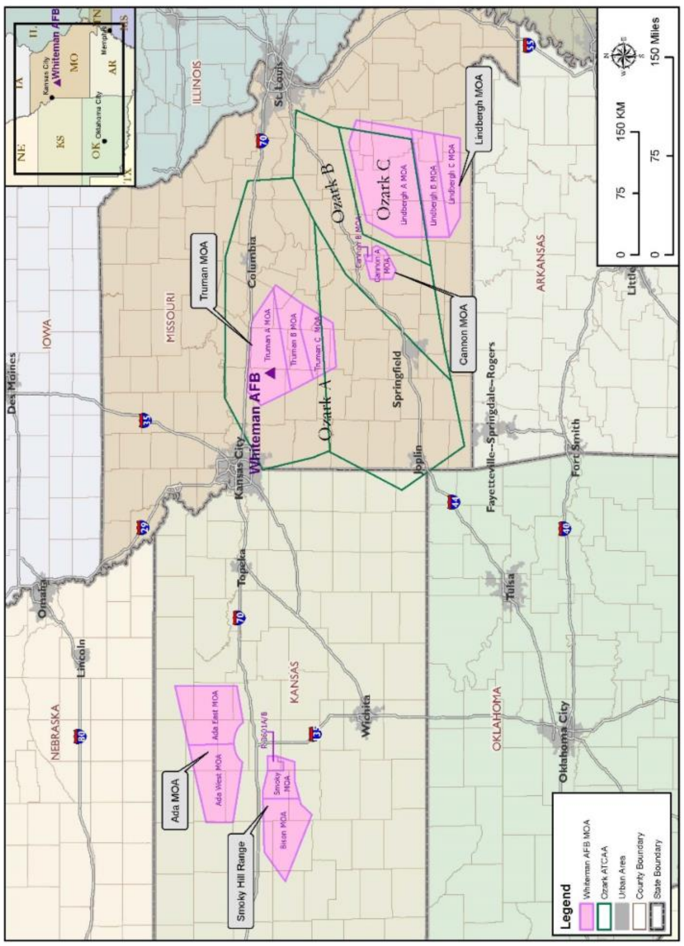
Attachment 2 – Whiteman AFB Alternative Range and Airspace Boundaries



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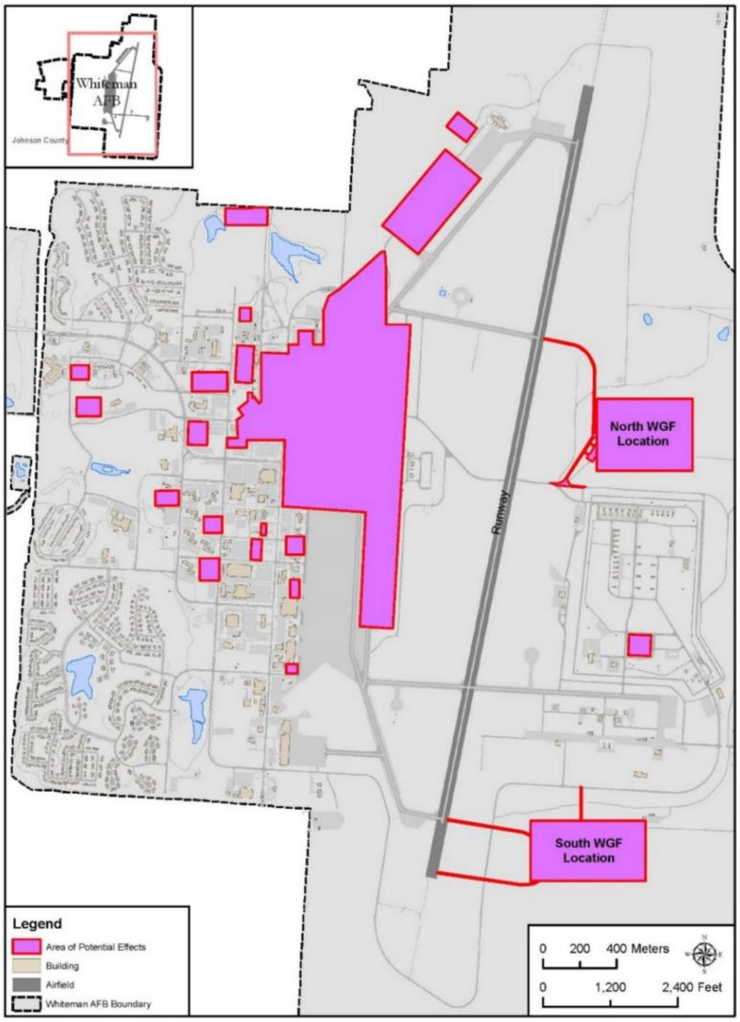
Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Whiteman AFB



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E.2 STATE HISTORIC PRESERVATION OFFICER (SHPO) CONSULTATION

E.2.1 Dyess Air Force Base

E.2.1.1 New Mexico State Historical Commission

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Dr. Jeff Pappas, SHPO
New Mexico State Historical Commission
407 Galisteo Street, Suite 236
Sante Fe NM 87501

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Dr. Pappas

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF would like to initiate consultation with your office for this undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEATH FROM ABOVE

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,550 military personnel, with approximately 3,060 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and annual airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Logistics Readiness Squadron Fuels Admin/Lab	7,089	New
Covered Refueler Parking and Apron Access	133,855	New
Low-Observable Hangar (2-Bay)	95,691	New
New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
National Airborne Operations Center Support	5,625	New
Weapons Loader Training (2-Bay)	56,268	Renovation (Bldg. 4230)
B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
Bldg. 4111	7,089	Demolition
Bldg. 4112	5,792	Demolition
Bldg. 4119	3,382	Demolition
Bldg. 4160	1,358	Demolition
Bldg. 4217	15,875	Demolition
Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet

Note:

a. The National Airborne Operations Center Support facility is not part of the B-21 program, but is a connected action as a result of displacement due to the beddown of the B-21.

The WGF is a facility that is unique to the B-21 mission and would require new construction at the selected base. The WGF will provide a safer and more secure location for the storage of DAF munitions, both conventional and unconventional. The final WGF compound size will be approximately 20 acres. The WGF compound would be double-fenced (approximately 7,100 linear feet), with approximately 8 acres of construction, consisting of 81,620 sf of facilities and 274,814 sf of parking/pavement areas. Due to national security implications, the details regarding the infrastructure associated with the WGF is not releasable to the public.

DAF planners identified five locations at Dyess AFB as possible sites for the WGF. Attachment 3 illustrates the five possible sites assessed by DAF planners. Four locations were eliminated due to the presence of one or more negative site evaluation criteria. Location 2 was eliminated because it occurs at an existing Explosive Ordnance Disposal range where the presence of unexploded ordnance is possible, which would require closure studies and necessitate construction of a new range at an undisturbed site. Locations 3 and 4 were eliminated because flood zones run across both sites. Location 5 was eliminated based on a combination of operational readiness concerns, including nearness to the airfield. Location 1 satisfied all evaluation criteria and was carried forward for evaluation in the B-21 MOB 2 EIS.

The Area of Potential Effects for this undertaking is therefore defined as the planned facilities and infrastructure projects described in Table 1. Due to operational security concerns, the exact locations of the facilities included in cannot be illustrated. Though exact locations cannot be illustrated, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations. Six historic properties have been identified on Dyess AFB and one of these buildings, 5020, would be renovated under this alternative. To date no traditional cultural properties have been identified on base.

The MOB 1 EIS identified a total of 15 National Register of Historic Places (NRHP)-listed properties, including two petroglyph sites; two pueblos, ruins, and other archaeological sites; five historic districts; three public buildings; two houses; and one other site. No National Historic Landmarks were identified within 20 miles of the airspace, and no Native American pueblos, reservations, or traditional cultural properties were located below the airspace. A review of NRHP records undertaken for the MOB 1 EIS indicated nine listed properties beneath the Lancer MOA in Texas; IR-178 was not considered for the MOB 1 EIS. These included four archaeological sites near Post in Garza County; the county sanitarium and courthouse in Post, Garza County; the First National Bank building in Jayton, Kent County; the Lynn County Courthouse in Tahoka; and the Lamesa Farm Workers Community Historic District in Los Ybanez, Dawson County. The Old Algerita Hotel in Post has been demolished.

An NRHP records search for the B-21 MOB 2 beddown at Dyess AFB identified no historic properties beneath the Lancer Bridge MOA in Texas.

The MOB 1 EIS identified 17 listed properties beneath the Brownwood MOA in Texas. These included a homestead and a railroad depot in Comanche County; the county jailhouse and courthouse in Goldthwaite and the Regency Suspension Bridge in Mills County; a railroad station, church, jail, high school, and two houses in Brownwood, Brown County; the Camp Colorado Replica in Coleman County; two houses and a Carnegie Library in Ballinger, Runnels County; and the county courthouse and Paint Rock Native American Pictograph Site in Concho County.

The MOB 1 EIS identified four NRHP-listed sites and one additional state register site (Rodrick Drug Store) located in Fort Sumner. No Native American reservations underlie the Pecos MOA. Fort Sumner State Monument and the Bosque Redondo Memorial were identified

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as a site of significant cultural activity for Navajo visitors who commemorate their forced removal, known as The Long Walk, and confinement at Bosque Redondo. A review of NRHP records undertaken for the MOB 1 EIS indicated five listed properties beneath the Pecos MOA, all located in Fort Sumner, DeBaca County, New Mexico. These included the Fort Sumner Ruins, Fort Sumner Cemetery Wall and Entry, Fort Sumner Railroad Bridge, Fort Sumner Community House, and the DeBaca County Courthouse.

A more recent records search of the NRHP was conducted March 3, 2023. No changes were noted to previously identified resources.

A review of NRHP records undertaken for the B-21 MOB 2 beddown at Dyess AFB identified five listed properties beneath the Bronco MOA. These include the Lea County Courthouse; the Lovington Fire Department; the Mathew Elmore Sewalt House; the Lea Theater; and the Pyburn House.

An NRHP records search for the B-21 MOB 2 beddown at Dyess AFB identified six listed properties beneath the Willie-Roscoe ATCAA in Texas. These historic properties include the Potton-Hayden House, Settles Hotel, First National Bank Building, Scott-Majors House, Ragland, R.A., Building, and the Newman, I.M. and Margaret House.

If you have any questions regarding this undertaking, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort.

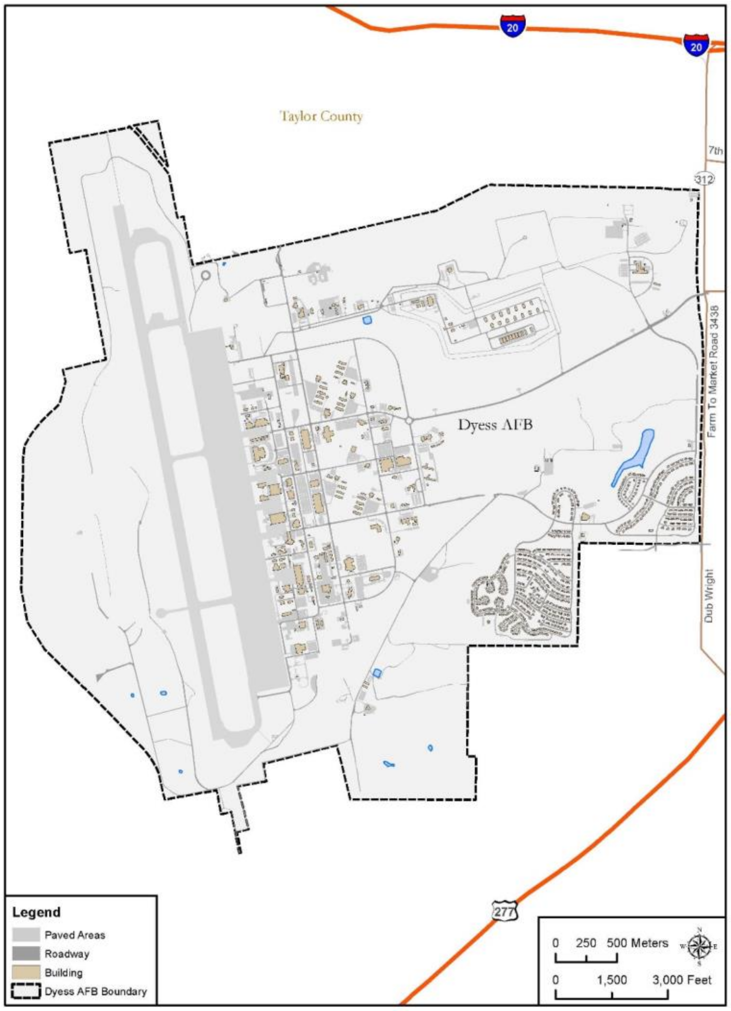
Sincerely

JK Kramer

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction Dyess AFB

Attachment 1 – Dyess AFB Location



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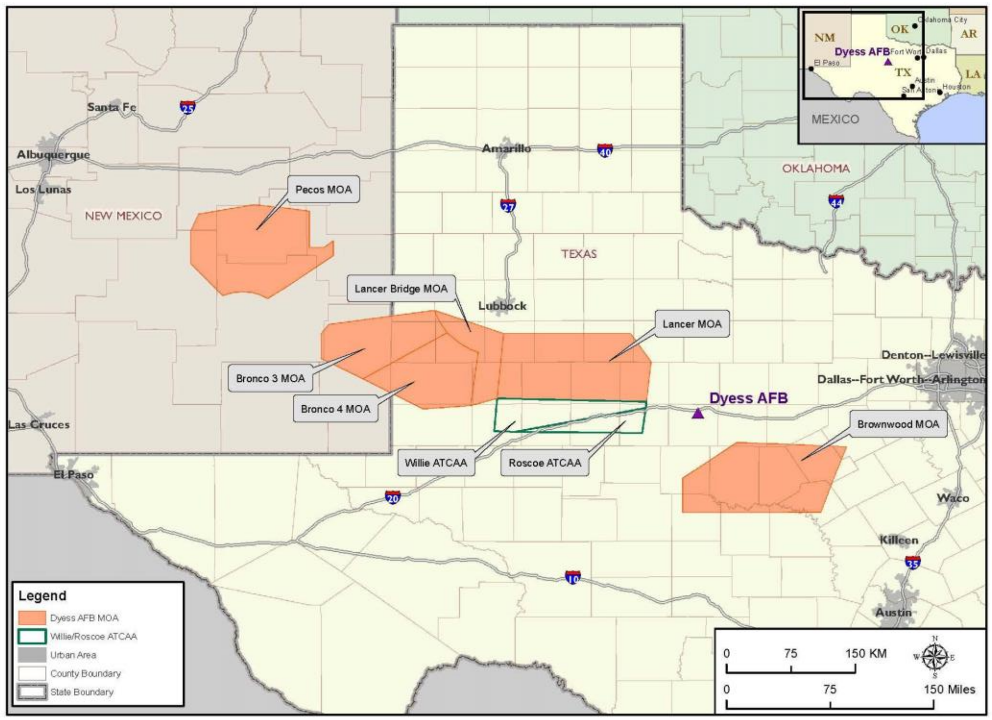
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



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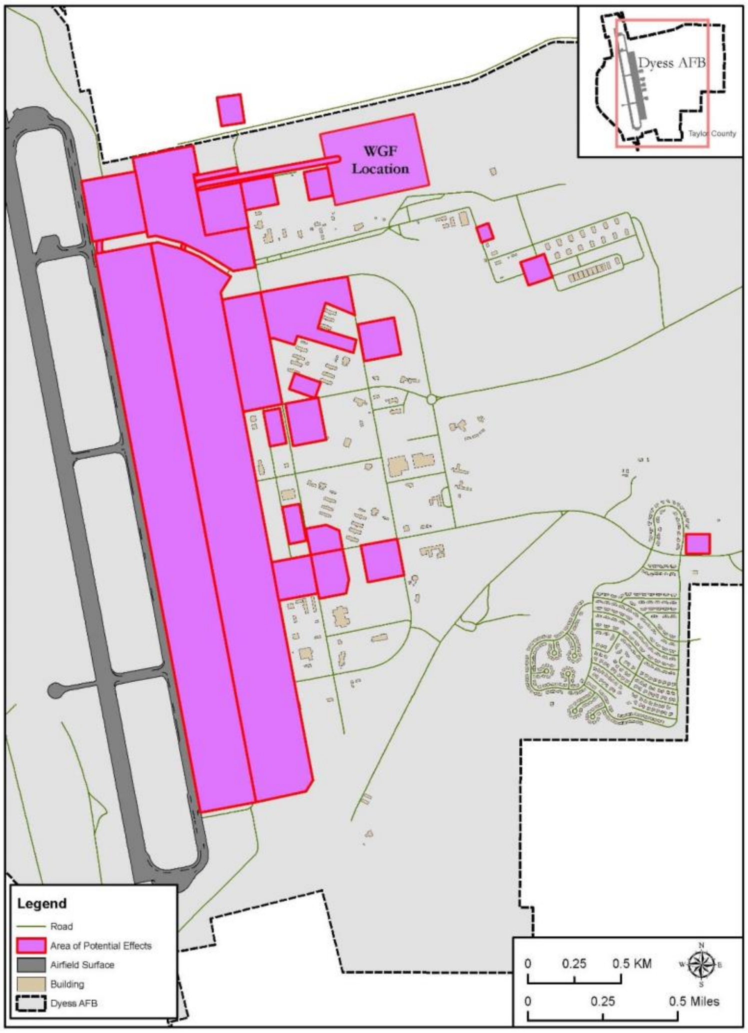
Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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E.2.1.2 Texas Historical Commission

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 7TH BOMB WING (AFGSC)
DYESS AIR FORCE BASE TEXAS

14 July 2023

Colonel Joseph K. Kramer
7th Bomb Wing/CC
7 Lancer Loop
Dyess AFB TX 79607-1240

Mr. Mark Wolfe, SHPO
Texas Historical Commission
108 W. 16th Street
Austin TX 78701

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Mr. Wolfe

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF would like to initiate consultation with your office for this undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEATH FROM ABOVE

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,550 military personnel, with approximately 3,060 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Dyess AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,300 personnel and annual airfield operations are expected to decrease by approximately 2,000 operations. For military aircraft flying out of Dyess AFB, the Lancer Military Operating Area (MOA), Lancer Bridge MOA, Bronco MOA, Pecos MOA, and all associated Air Traffic Control Assigned Airspaces (ATCAAs), including the Willie-Roscoe ATCAA would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Dyess AFB are listed in Table 1 and would include an estimated 4.4 million square feet (sf) of construction, 580,000 sf of renovation, and 310,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

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New Low-Observable Hangar Apron	16,829	New
Hangar Apron Maintenance	168,855	Repair (on Existing Pavement)
Simulator Facility	35,000	New
Radio Frequency/Measurements Hangar	57,532	New
Field Training Detachment	55,884	New
Mission Planning Facility	47,117	New
Fuel Cell/Wash Rack (2-Bay)	69,552	New
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B-21 Aerospace Ground Equipment	32,297	New
Phase Dock/General Maintenance Hangar	128,492	Renovation (Bldg. 5020)
B-21 Armaments Storage – on Flightline	5,000	New
B-21 Armaments Storage – off Flightline	45,000	Renovation (Bldg. 9112)
B-21 Squad Operations/Aircraft Maintenance Unit	120,000	New
Alternate Fuel Cell	23,053	Renovation (Bldg. 4315)
B-21 Aircraft Parts Store	40,000	New (on Existing Pavement)

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type
Environmental Shelters (28)	21,200 x 28 = 593,600	New (on Existing Pavement)
77th Weapons Squadron/337th Test and Evaluation Squadron	34,592	Renovation (Bldg. 6030)
Base Operations/Passenger Terminal	11,795	Renovation (Bldg. 5225)
Alert Facility	40,000	New (on Existing Pavement)
Alert Apron/Ramp and Road	1,224,036	New
Logistics Readiness Squadron Cargo Pad [Uncovered Open Storage]	63,000	New
Aerospace Ground Equipment Yard [Covered and Uncovered Storage]	60,000	New
Conventional Maintenance	18,200	New
B-21 Supply Warehouse Support	25,000	Renovation (Bldg. 7004)
Base Supply Store	10,000	Renovation (Bldg. 7008)
Fall Protection	23,288	Renovation (Bldg. 5105)
Bldg. 4101	3,000	Demolition and Relocation
Bldg. 4111	7,089	Demolition
Bldg. 4112	5,792	Demolition
Bldg. 4119	3,382	Demolition
Bldg. 4160	1,358	Demolition
Bldg. 4217	15,875	Demolition
Bldg. 4218	11,372	Demolition
Bldg. 9001	11,795	Demolition
Existing Pavement Demolition	250,000 ft^3	Demolition
New Pavement	1,364,708	New
Flightline Fence Demolition/Construction	7,160/ 8,400 linear ft	Demolition/New
BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
BOS – Child Development Center	8,000	Addition (Bldg. 8150)
BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support; ft = feet; ft^3 = cubic feet
Note:
a. The National Airborne Operations Center Support facility is not part of the B-21 program, but is a connected action as a result of displacement due to the beddown of the B-21.

The WGF is a facility that is unique to the B-21 mission and would require new construction at the selected base. The WGF will provide a safer and more secure location for the storage of DAF munitions, both conventional and unconventional. The final WGF compound size will be approximately 20 acres. The WGF compound would be double-fenced (approximately 7,100 linear feet), with approximately 8 acres of construction, consisting of 81,620 sf of facilities and 274,814 sf of parking/pavement areas. Due to national security implications, the details regarding the infrastructure associated with the WGF is not releasable to the public.

DAF planners identified five locations at Dyess AFB as possible sites for the WGF. Attachment 3 illustrates the five possible sites assessed by DAF planners. Four locations were eliminated due to the presence of one or more negative site evaluation criteria. Location 2 was eliminated because it occurs at an existing Explosive Ordnance Disposal range where the presence of unexploded ordnance is possible, which would require closure studies and necessitate construction of a new range at an undisturbed site. Locations 3 and 4 were eliminated because flood zones run across both sites. Location 5 was eliminated based on a combination of operational readiness concerns, including nearness to the airfield. Location 1 satisfied all evaluation criteria and was carried forward for evaluation in the B-21 MOB 2 EIS.

The Area of Potential Effects for this undertaking is therefore defined as the planned facilities and infrastructure projects described in Table 1. Due to operational security concerns, the exact locations of the facilities included in cannot be illustrated. Though exact locations cannot be illustrated, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Dyess AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations. Six historic properties have been identified on Dyess AFB and one of these buildings, 5020, would be renovated under this alternative. To date no traditional cultural properties have been identified on base.

The MOB 1 EIS identified a total of 15 National Register of Historic Places (NRHP)-listed properties, including two petroglyph sites; two pueblos, ruins, and other archaeological sites; five historic districts; three public buildings; two houses; and one other site. No National Historic Landmarks were identified within 20 miles of the airspace, and no Native American pueblos, reservations, or traditional cultural properties were located below the airspace. A review of NRHP records undertaken for the MOB 1 EIS indicated nine listed properties beneath the Lancer MOA in Texas; IR-178 was not considered for the MOB 1 EIS. These included four archaeological sites near Post in Garza County; the county sanitarium and courthouse in Post, Garza County; the First National Bank building in Jayton, Kent County; the Lynn County Courthouse in Tahoka; and the Lamesa Farm Workers Community Historic District in Los Ybanez, Dawson County. The Old Algerita Hotel in Post has been demolished.

An NRHP records search for the B-21 MOB 2 beddown at Dyess AFB identified no historic properties beneath the Lancer Bridge MOA in Texas.

The MOB 1 EIS identified 17 listed properties beneath the Brownwood MOA in Texas. These included a homestead and a railroad depot in Comanche County; the county jailhouse and courthouse in Goldthwaite and the Regency Suspension Bridge in Mills County; a railroad station, church, jail, high school, and two houses in Brownwood, Brown County; the Camp Colorado Replica in Coleman County; two houses and a Carnegie Library in Ballinger, Runnels County; and the county courthouse and Paint Rock Native American Pictograph Site in Concho County.

The MOB 1 EIS identified four NRHP-listed sites and one additional state register site (Rodrick Drug Store) located in Fort Sumner. No Native American reservations underlie the Pecos MOA. Fort Sumner State Monument and the Bosque Redondo Memorial were identified as a site of significant cultural activity for Navajo visitors who commemorate their forced removal, known as The Long Walk, and confinement at Bosque Redondo. A review of NRHP records undertaken for the MOB 1 EIS indicated five listed properties beneath the Pecos MOA, all located in Fort Sumner, DeBaca County, New Mexico. These included the Fort Sumner Ruins, Fort Sumner Cemetery Wall and Entry, Fort Sumner Railroad Bridge, Fort Sumner Community House, and the DeBaca County Courthouse.

A more recent records search of the NRHP was conducted March 3, 2023. No changes were noted to previously identified resources.

A review of NRHP records undertaken for the B-21 MOB 2 beddown at Dyess AFB identified five listed properties beneath the Bronco MOA. These include the Lea County Courthouse; the Lovington Fire Department; the Mathew Elmore Sewalt House; the Lea Theater; and the Pyburn House.

An NRHP records search for the B-21 MOB 2 beddown at Dyess AFB identified six listed properties beneath the Willie-Roscoe ATCAA in Texas. These historic properties include the Potton-Hayden House, Settles Hotel, First National Bank Building, Scott-Majors House, Ragland, R.A., Building, and the Newman, I.M. and Margaret House.

If you have any questions regarding this undertaking, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort.

Sincerely

JK.Kramer

JOSEPH K. KRAMER, Colonel, USAF
Commander

Attachments:
Attachment 1 Dyess AFB Location
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction Dyess AFB

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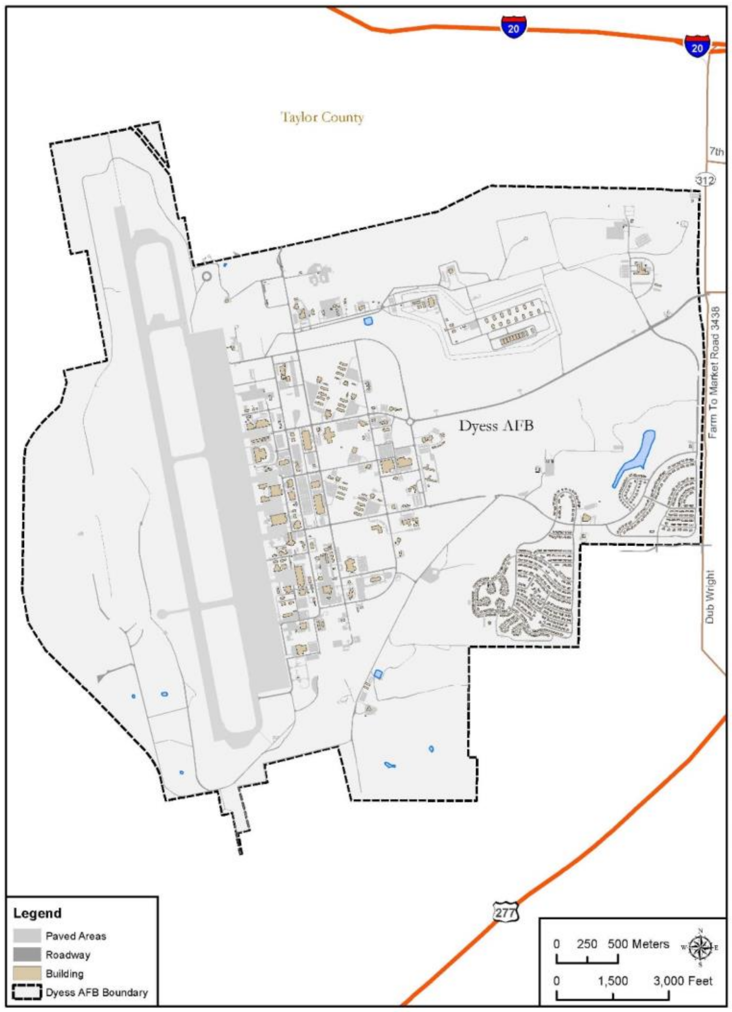
Attachment 1 – Dyess AFB Location



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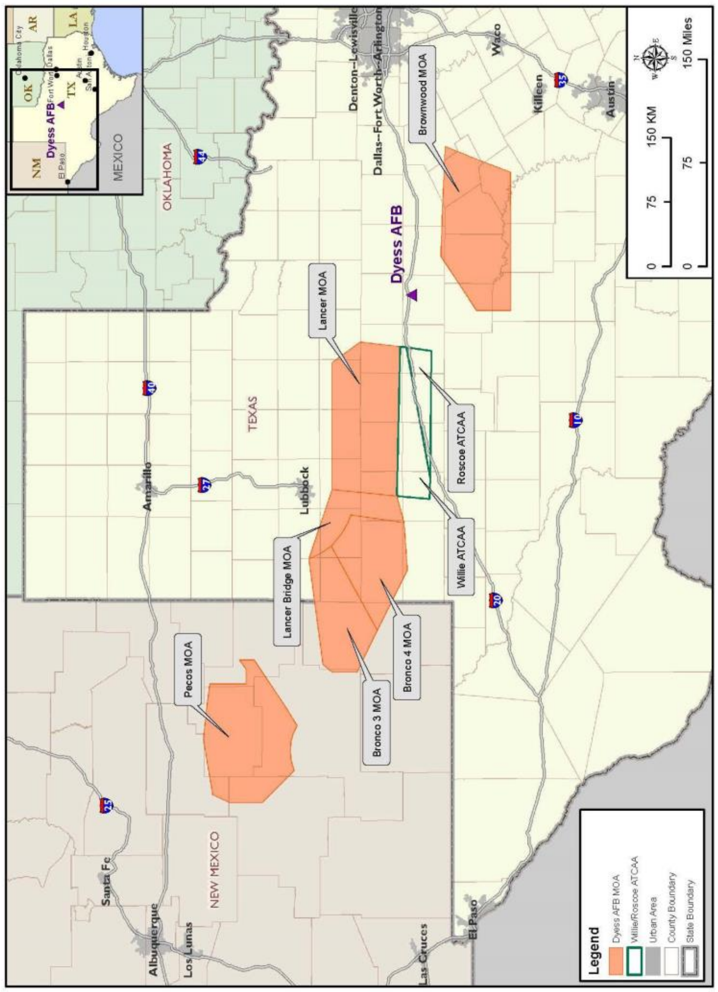
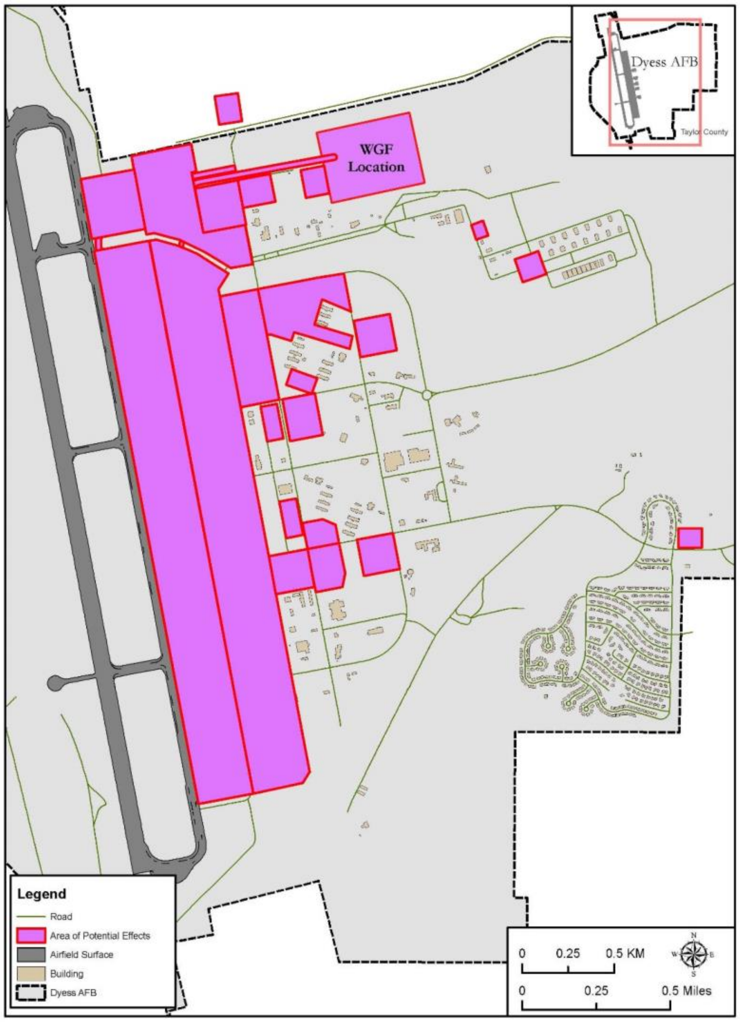
Attachment 2 – Dyess AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Dyess AFB



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Correspondence from Texas SHPO dated August 29, 2023

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Tuesday, August 29, 2023 2:50 PM
To: FOREMAN, BRYAN W CIV USAF AFGSC 7 CES/CENP <bryan.foreman@us.af.mil>; reviews@thc.state.tx.us
Subject: [Non-DoD Source] Dyess AFB

TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202311945
Date: 08/29/2023
Dyess AFB

Description: evaluate impacts associated with B-21 Main Operating Base (MOB 2) or MOB 3 Beddown

Dear Client:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act. The review staff, led by Tiffany Osburn, Caitlin Brashear and Alexander Shane, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- Property/properties are eligible for listing or already listed in the National Register of Historic Places.
- THC/SHPO unable to complete review at this time based on insufficient documentation. A supplemental review must be submitted, and the 30-day review period will begin upon receipt of adequate documentation.
- THC/SHPO unable to complete review at this time based on insufficient documentation. A supplemental review must be submitted, and the 30-day review period will begin upon receipt of adequate documentation.

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

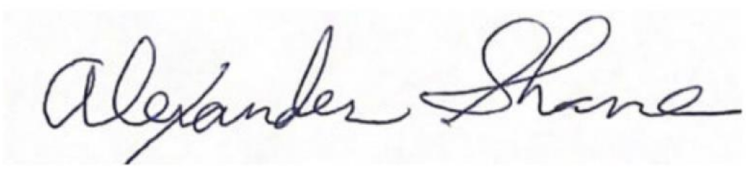
We have the following comments: The History Programs Division review staff has reviewed the above-referenced project and has determined that in additional to the National Register of Historic Places (NRHP)-listed resources identified in the report, any historic-age resources identified in the proposed Area of Potential Effect (APE) will need to be identified and evaluated for listing in the NRHP. The Division of Architecture Review Staff, led by Alexander Shane, cannot provide an accurate determination without further information specifically listing the listed properties generically called out within the letter.

In the supplemental submission the Division of Architecture requires a comprehensive list and photographs of all listed properties within the area of potential effect.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: tiffany.osburn@thc.texas.gov, caitlin.brashear@thc.texas.gov, Alexander.Shane@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,



for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

E.2.2 Whiteman Air Force Base

E.2.2.1 Missouri State Preservation Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

10 July 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Suite 116
Whiteman AFB MO 65305

Dr. Toni Prawl, SHPO
Missouri State Historic Preservation Office
P.O. Box 176
Jefferson City MO 65102

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Dr. Prawl

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF would like to initiate consultation with your office for this undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEATH FROM ABOVE

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

This action will address Dyess AFB and Whiteman AFB as basing alternatives for the Proposed Action, as well as a No Action Alternative. The basing alternatives were developed to minimize mission impact, maximize facility reuse, minimize cost, and reduce overhead, as well as leverage the strengths of each base to optimize the B-21 beddown strategy. The DAF estimates that the B-21 MOB 2 mission would require approximately 2,500 military personnel, with approximately 3,100 dependents accompanying these personnel. The annual estimated number of total aircraft operations will be 6,840 per year for all the squadrons (Operations and Formal Training Unit). Forty percent of all sorties will be conducted between 10:00 p.m. and 7:00 a.m.

Under the Whiteman AFB Alternative (Attachment 1), the total number of end-state personnel is anticipated to increase by approximately 1,000 personnel and annual airfield operations are expected to increase by approximately 2,000 operations. For military aircraft flying out of Whiteman AFB, Smoky Hill Range (Smoky Military Operating Area (MOA), Bison MOA and R-3601A/B), Cannon MOA (A and B), and Ada MOA (East and West), including all associated Air Traffic Control Assigned Airspaces (ATCAAs), as well as the Ozark ATCAA (A, B, and C) would be utilized for airspace operations (Attachment 2). Planned facilities and infrastructure projects to establish the B-21 MOB 2 at Whiteman AFB are listed in Table 1 and would include an estimated 600,000 square feet (sf) of construction, 1.7 million sf of renovation, and 85,000 sf of demolition be implemented. Due to operational security concerns, the exact locations of the facilities listed in Table 1 cannot be illustrated; therefore, Attachment 3 shows where DAF planners evaluated land use limitations and identified a general planned area of construction, or construction footprint.

Table 1. Facilities and Infrastructure for the Whiteman AFB Alternative

Facility	Size (Square Feet)	Building Type
Field Training Detachment	34,399/20,000	Renovation/Addition (Bldg. 152)
Field Training Detachment Parking Area	47,916	New
Radio Frequency Hangar	57,532	New
Armament Shop (Weapons Release & Suspension Shop)	7,500/17,000	Renovation/Addition (Bldg. 5208)
Weapons Load Trainer (2-Bay)	60,225	New
Hangar 4	29,225	Demolition
Cockpit Procedure Trainer	29,383 5,000	Demolition (Bldg. 706) New
Chadwell Cockpit Procedure Trainer	5,000	New
Special Access Program Space	38,209	Renovation (Bldg. 509)
Simulator Facility (Phase 1)	92,511	Renovation (Bldg. 153)
Simulator Facility (Phase 2)	92,511	Renovation (Bldg. 153)
Low-Observable Hangar (2-Bay)	81,776	Renovation (Bldg. 5205/5206)
Low-Observable Equipment Facility	8,000	New
Snow Removal Areas	100,000	New
Base Supply Warehouse	106,588	Renovation (Bldg. 139)

Table 1. Facilities and Infrastructure for the Whiteman AFB Alternative

Facility	Size (Square Feet)	Building Type
Aircraft Maintenance Unit Composite Tool Kit	37,258	Renovation (Bldg. 14)
Phase Dock (2-Bay)	148,407	Renovation (Bldg. 9)
General Maintenance Hangars (14)	26,500 x 14 = 371,000	Renovation (Docks 1–14)
Aircraft Maintenance Units 1 & 2	40,617	Renovation (Bldg. 33)
Wash Rack Hangar	31,837	Renovation (Bldg. 27)
Aircraft Parts Store	16,965	Renovation (Bldg. 26)
Fuel Cell Hangar	30,474	Renovation (Bldg. 1)
Operations Overflow	33,147	Renovation (Bldg. 200)
Environmental Shelters (11)	21,400 x 11 = 235,400	New (on Existing Pavement)
Roads/Road Access	91,191	New
Bldg. 43	26,393	Demolition
Petroleum, Oil, and Lubricant Operations	4,183/1,687	Renovation/Addition (Bldg. 90)
Petroleum, Oil, and Lubricant Parking	4,500	Addition
Storage/Maintenance	24,742	Renovation (Hangar 52)
Hazardous Materials Pharmacy	8,683/4,000	Renovation/Addition (Bldg. 114)
Maintenance Facility	39,917	Renovation (Bldg. 7)
Propulsion Shop	24,084	Renovation (Bldg. 2)
Mobility Warehouse	23,732	Renovation (Bldg. 115)
Combined Operations Building	79,190	Renovation (Bldg. 38)
Low-Observable Supply Building	2,770	Renovation (Bldg. 5214)
Intermediate Maintenance Facility	68,941	Renovation (Bldg. 4055)
Aircrew Flight Equipment	5,203	Renovation (Bldg. 32)
Engine Test Cell	4,479	Renovation (Bldg. 5203)
BOS – Dorm (144-Person Occupancy; Three Stories)	119,985	New
BOS – Child Development Center	8,000	Addition
BOS – Youth Center	8,387	Addition
BOS – Fitness Center	33,500	Addition
BOS – Dining Facility	4,000	Addition

Key: AFB = Air Force Base; Bldg. = Building; BOS = Base Operating Support

The WGF is a facility that is unique to the B-21 mission and would require new construction at the selected base. The WGF will provide a safer and more secure location for the storage of DAF munitions, both conventional and unconventional. The final WGF compound size will be approximately 20 acres. The WGF compound would be double-fenced (approximately 7,100 linear feet), with approximately 8 acres of construction, consisting of 81,620 sf of facilities and 274,814 sf of parking/pavement areas. Due to national security implications, the details regarding the infrastructure associated with the WGF is not releasable to the public.

DAF planners identified five possible locations at Whiteman AFB for the WGF. Attachment 3 illustrates the five possible sites assessed by DAF planners, including the two preferred locations. After applying the planning process, the DAF eliminated three locations.

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Location 1 was eliminated because of impacts to current missions, including limiting potential future capabilities of the 442 FW weapons storage area, security related issues, and weapons safety concerns. Location 4 was eliminated due to site constraints that would limit potential future capabilities of the weapons storage area, in addition to impacts to current missions. Location 5 was eliminated due to site constraints associated with airfield criteria and proximity to existing infrastructure and would interfere with navigational aids, create access issues for the existing docks and would require access to the airfield to get to the WGF. Therefore, Locations 2 and 3 were selected as proposed locations because they satisfied the site evaluation criteria unique to the WGF. Location 2 is hereafter referred to as the North WGF Site and Location 3 is the South WGF Site.

The Area of Potential Effects (APE) for this undertaking is therefore defined as the planned facilities and infrastructure projects described in Table 1 and shown as general planned areas of construction, or construction footprints in Attachment 3. As this B-21 MOB 2 beddown is a replacement mission to similar ongoing operations on Whiteman AFB, no significant changes to auditory, vibration or aesthetic effects would be anticipated from future aircraft operations.

The DAF has not recognized any historic structures, archaeological properties or historic districts at Whiteman AFB within the APE; the base reflects development over time as mission needs have changed, resulting in the ongoing removal and addition of facilities. While the newly proposed facilities and infrastructure associated with the B-21 MOB 2 beddown may be within view of some historic properties, these historic resources currently exist within the setting of an active DAF base made up of a combination of historic and non-historic facilities, and thus visual effects of the new construction would be minimal.

Archaeological investigations conducted at the base in 1989 included background research and archaeological field surveys of the portions of the base that were identified as having the potential to contain historic and prehistoric archaeological remains. Five historic sites associated with late 19th century farmsteads were identified as a result of the investigations, but none of these sites were determined to be National Register of Historic Places (NRHP) eligible. A subsequent archaeological assessment conducted in 1994 identified five remaining areas for subsurface investigation on the base. Surveys of these areas were conducted in 1996 and 2002 and determined that each of these areas were negative for pre-contact and historic archaeological resources. A few modern historic trash dump locations were encountered and recorded, but none of these were found to be of cultural significance. No other areas within the current boundaries of the base require archaeological investigation.

The Integrated Cultural Resources Management Plan identifies no known traditional cultural properties, Native American burials, or sacred areas on Whiteman AFB. There is one federally recognized tribe affiliated with the lands managed by Whiteman AFB, the Osage Nation of Oklahoma.

The NRHP records search identified 388 listed buildings and structures and 7 archaeological sites beneath the Ozark ATCAA. Representative properties include the Old Bonnie & Clyde Garage Apartment; the Joplin Carnegie Library, Route 66 Steak‘'n Shake; Missouri, Kansas, and Texas Railroad Depot; Arrow Rock State Historic Site Bridge; the Dam

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and Spillway in the Hatchery Area at Montauk State Park; Santa Fe Trail–Grand Pass Trail Segments; and Berry Cemetery. There are 47 NRHP-listed districts under the Ozark ATCAA. Representative districts include Kansas Route 66 Historic District–East Galena; Ava Ranger Station Historic District; and the New Lebanon Historic District.

Approximately 1,400 acres of the Ozark ATCAA overlaps with the Quapaw border in Kansas. The Quapaw Nation is headquartered in Quapaw in Ottawa County, Oklahoma. Their tribal jurisdictional area is 13,000 acres in size.

A review of the NRHP records identified a total of 37 listed properties beneath the Truman MOA in Missouri. Representative properties include Montserrat Recreational Demonstration Area Rock Bath House; Johnson County Courthouse; Mount Nebo Baptist Church; and the Montserrat Recreation Demonstration Area Bridge.

There are 12 NRHP-listed districts under the Truman MOA. Representative districts include Osage Farms Units No. 5 and No. 6 Historic District; Grover Street Victorian Historic District; and the Bois d'Arc Cooperative Dairy Farm Historic District.

An NRHP records search for the B-21 MOB 2 beddown at Whiteman AFB identified no historic properties beneath the Cannon MOA in Missouri.

NRHP records identified 16 listed buildings and structures and one listed archaeological site beneath the Lindbergh MOA in Missouri. Representative properties include the Old Mill at Montauk State Park; the Dent County Courthouse, International Shoe Company Building; Mount Zion Lodge Masonic Temple; Civil War Fortification at Barnesville; and Osterhout Mound Park.

There is one NRHP-listed district under the Lindbergh MOA: the Houston Ranger Station Historic District.

A review of NRHP records identified eight listed properties beneath the Ada West MOA in Kansas. Representative properties include the Salt Creek Truss Leg Bedstead Bridge; Pott's Ford Bridge; and Mitchell County Courthouse. Five listed properties are located beneath the Ada East MOA in Kansas. These include the Republican River Pegram Truss; Clay County Courthouse; and Clay Center Carnegie Library.

A review of NRHP records identified 18 NRHP-listed properties or districts beneath the Smoky Hill Range in Kansas. Representative properties include the Fort Harker Officers Quarters, the Aurthur Larkin House, Ellsworth Downtown Historic District, and the Beaver Creek Native Stone Bridge.

If you have any questions, please contact Mr. Chris Moore (AFCEC/CZN), AFCEC Point of Contact at 512.417.3715 or by email at christopher.moore.114@us.af.mil. Thank you in advance for your assistance in this effort.

Sincerely

KEITH J. BUTLER, Colonel, USAF
Commander

Attachments:
Attachment 1 Whiteman AFB Location
Attachment 2 Whiteman AFB Alternative Range and Airspace Boundaries
Attachment 3 Facilities and Infrastructure Planned Areas of Construction Whiteman AFB

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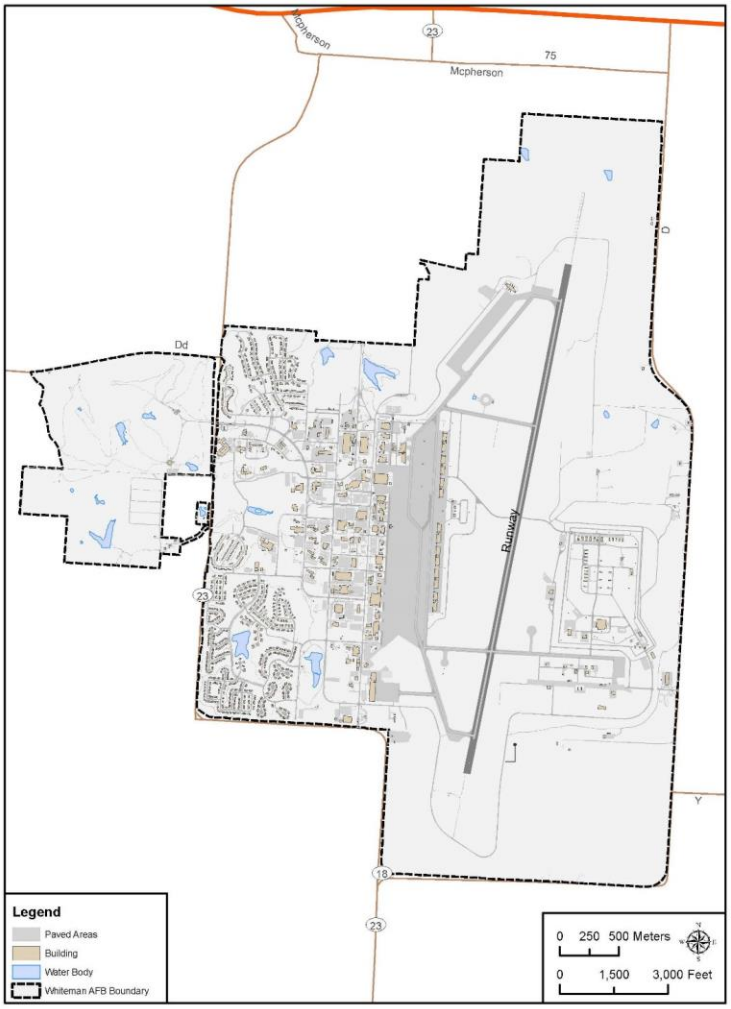
Attachment 1 – Whiteman AFB Location



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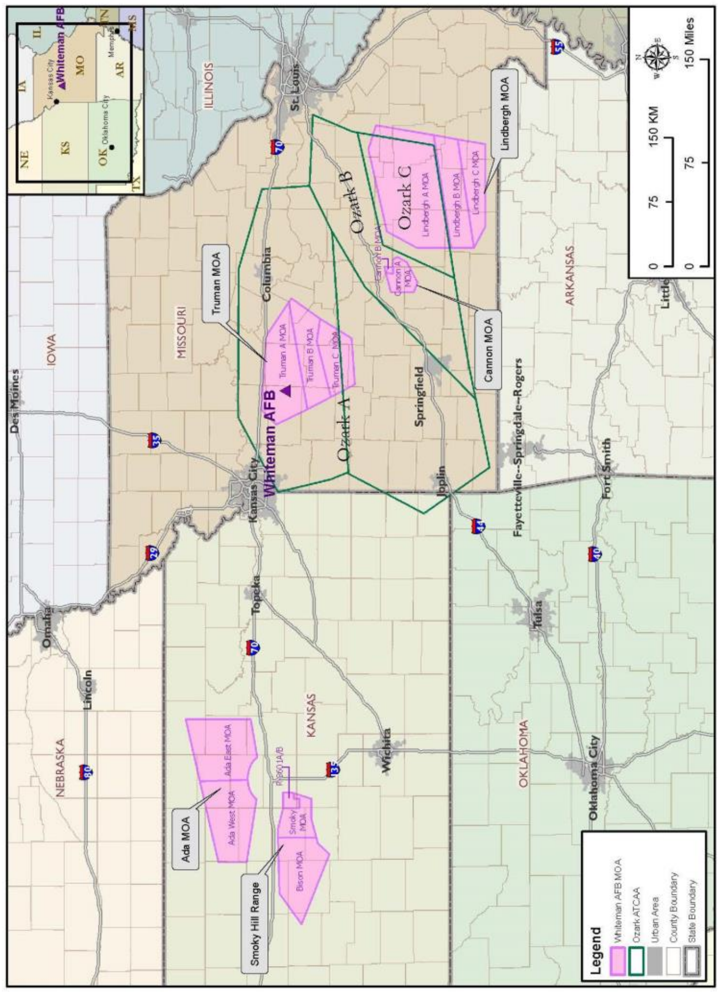
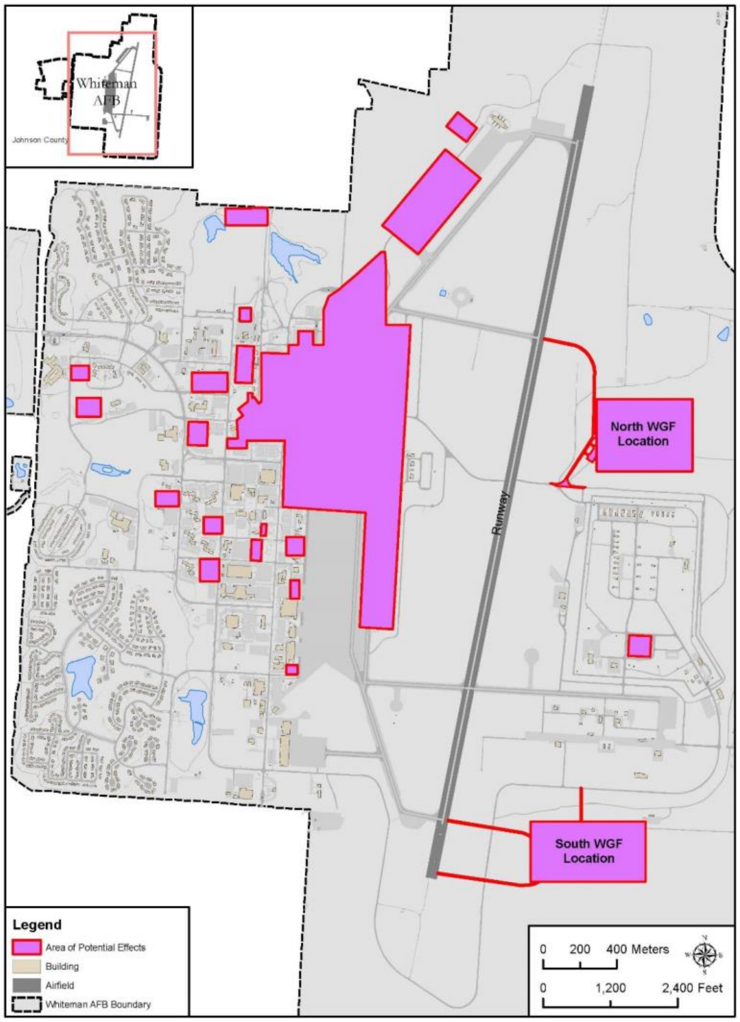
Attachment 2 – Whiteman AFB Alternative Range and Airspace Boundaries



Attachment 3 – Facilities and Infrastructure Planned Areas of Construction Whiteman AFB



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Correspondence from Missouri SHPO dated August 16, 2023

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

August 16, 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Suite 116
Whiteman AFB, MO 65305

Re: **SHPO Project Number: 007-JO-23** – Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown, Whiteman AFB, Johnson County, Missouri (DOD-AF)

Dear Colonel Keith J. Butler:

Thank you for submitting information to the State Historic Preservation Office (SHPO) regarding the above-referenced project for review pursuant to Section 106 of the National Historic Preservation Act, P.L. 89-665, as amended (NHPA), and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which require identification and evaluation of historic properties.

We have reviewed the information regarding the above-referenced project and have included our comments on the following page(s). Please retain this documentation as evidence of consultation with the Missouri SHPO under Section 106 of the NHPA. SHPO concurrence does not complete the Section 106 process as federal agencies will need to conduct consultation with all interested parties. **Please be advised that, if the current project area or scope of work changes, such as a borrow area being added, or cultural materials are encountered during construction, appropriate information must be provided to this office for further review and comment.**

If you have questions please contact the SHPO at (573)751-7858 or call/email Jeffrey Alvey, (573) 751-7862, jeffrey.alvey@dnr.mo.gov. If additional information is required please submit the information via email to MOSection106@dnr.mo.gov.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl

Toni M. Prawl, PhD
Director and Deputy
State Historic Preservation Officer

PO Box 176, Jefferson City, MO 65102-0176 • dnr.mo.gov

August 16, 2023
Colonel Keith J. Butler
Page 2 of 2

SHPO Project Number: 007-JO-23 – Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown, Whiteman AFB, Johnson County, Missouri (DOD-AF)

COMMENTS:

We have reviewed the letter dated July 10, 2023 inviting our office to offer comments on the above-referenced project. We thank you for the opportunity to comment on this project as it develops. After reviewing the description of the proposed undertaking, we have no comments at this time. We look forward to continued consultation on this project with your agency.

SHPO Reviewer: Jeffrey Alvey, (573) 751-7862, jeffrey.alvey@dnr.mo.gov

E.2.2.2 Kansas State Historic Preservation Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

10 July 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Suite 116
Whiteman AFB MO 65305

Ms. Katrina Ringler, SHPO
Kansas State Historic Preservation Office
6425 SW 6th Avenue
Topeka KS 66615

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Ms. Ringler

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF would like to initiate consultation with your office for this undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEATH FROM ABOVE

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

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Sincerely

KEITH J. BUTLER, Colonel, USAF
Commander

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Attachment 2 Whiteman AFB Alternative Range and Airspace Boundaries
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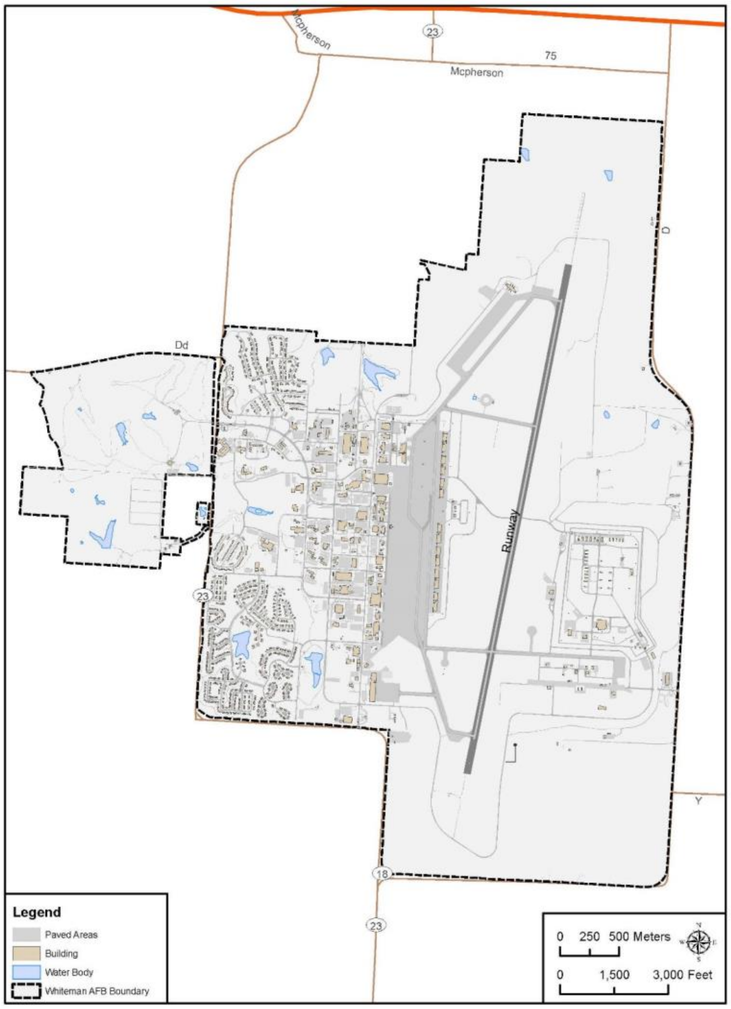
Attachment 1 – Whiteman AFB Location



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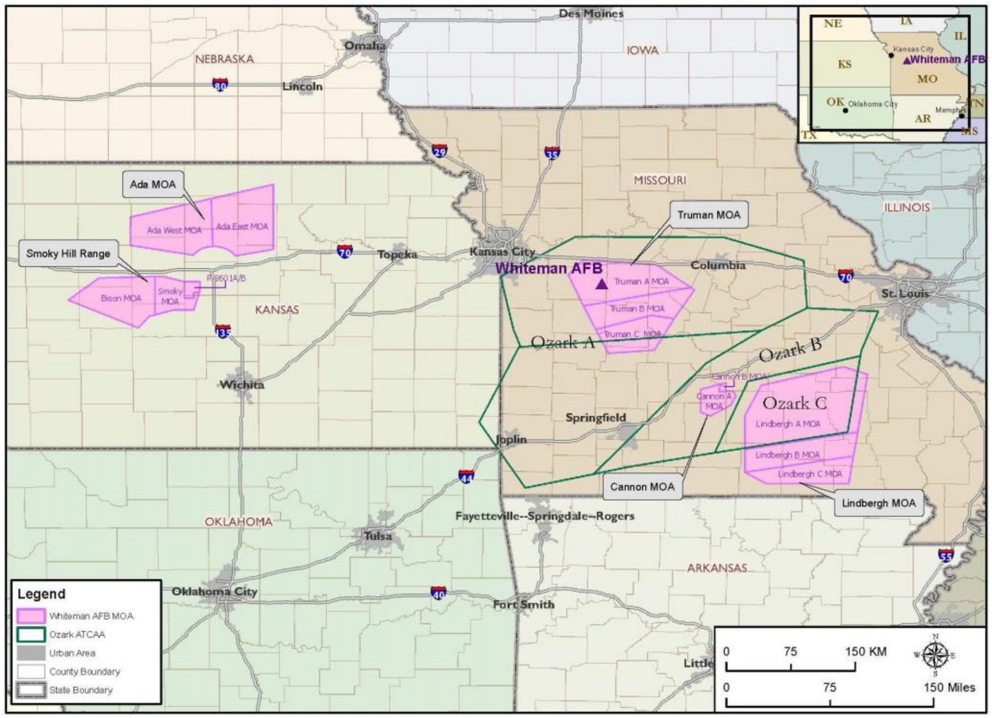

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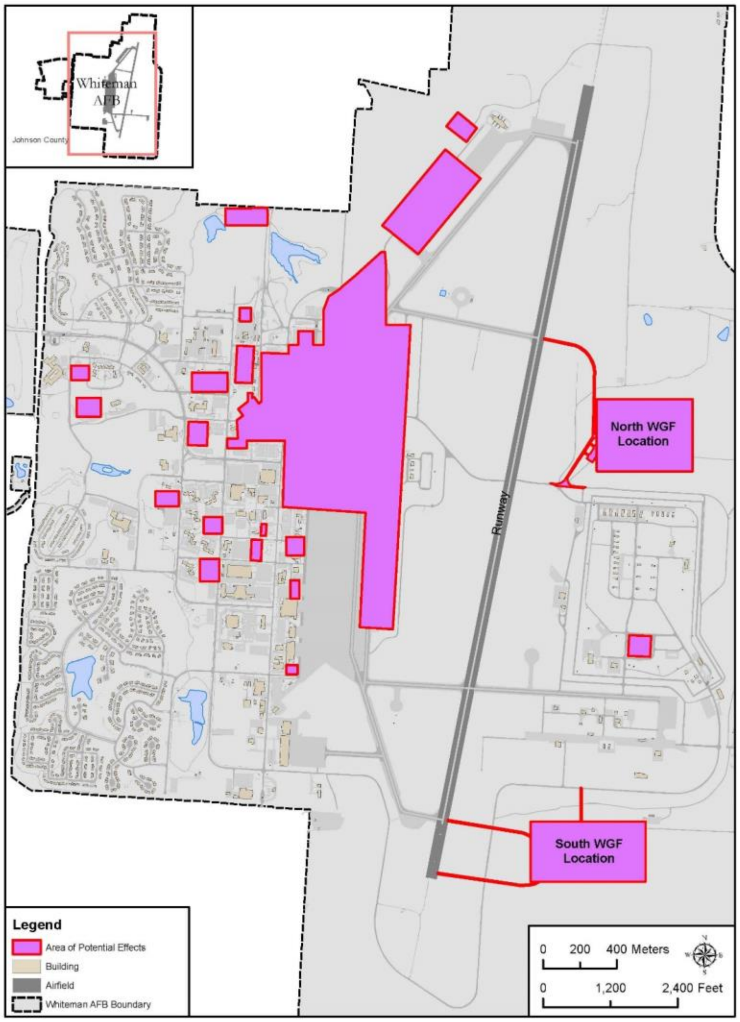

Correspondence from Kansas SHPO dated July 28, 2023

State Historic Preservation Office
Cultural Resources Division
6425 SW 6th Avenue
Topeka KS 66615-1099

Kansas
Historical Society

785-272-8681
fax 785-272-8682
kshs.shpo@ks.gov
kshs.org

Patrick Zollner, Executive Director

Laura Kelly, Governor

KSR&C # 23-07-269
July 28, 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Ste. 116
Whiteman AFB MO 65305

Re: Initiation of Consultation for B-21 MOB 2 or MOB 3 Beddown at Dyess AFB, Texas or Whiteman AFB, Missouri

Dear Colonel Butler,

The Kansas State Historic Preservation Office (SHPO) has received your letter dated July 10, 2023 regarding the project noted above. Upon review of the contents of that letter and enclosures, we find that this project does not appear to have an impact on cultural resources in Kansas other than the overlap of the associated Air Traffic Control Assigned Airspaces (ATCAAs). We appreciate the opportunity to consult on this project. Please accept this letter as our request to be removed from future consultations on this project.

Please refer to the Kansas State Review & Compliance number (KSR&C#) listed above on any future correspondence. If you have any questions concerning this review, please contact me at Katrina.Ringler@ks.gov or 785-272-8681 x217.

Sincerely,

Patrick Zollner
State Historic Preservation Officer

Katrina L. Ringler
Director, Cultural Resources Division
Deputy State Historic Preservation Officer

cc: Mr. Chris Moore via email

E.2.2.3 Oklahoma State Historic Preservation Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 509TH BOMB WING (AFGSC)
WHITEMAN AIR FORCE BASE, MISSOURI

10 July 2023

Colonel Keith J. Butler
509 BW/CC
509 Spirit Blvd., Bldg. 509, Suite 116
Whiteman AFB MO 65305

Mr. Trait Thompson, SHPO
Oklahoma State Historic Preservation Office
800 Nazih Zuhdi Drive
Oklahoma City OK 73105

SUBJECT: Initiation of Consultation for B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri

Dear Mr. Thompson

The Department of the Air Force (DAF) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force Base (AFB), Texas, or Whiteman AFB, Missouri. Per Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations at 36 Code of Federal Regulations Part 800, the DAF would like to initiate consultation with your office for this undertaking.

As part of the proposed undertaking, this EIS evaluates potential environmental consequences associated with establishing MOB 2 at two alternative bases: Dyess AFB or Whiteman AFB. The proposed MOB 2 and MOB 3 beddown includes B-21 Operational Squadrons, a Weapons Instructor Course, and Operational Test and Evaluation Squadron, as well as a Weapons Generation Facility (WGF). Potential impacts of these four components (i.e., Operations Squadrons, Weapons Instructor Course, Operational Test and Evaluation, and WGF) will be analyzed in this EIS for both alternative locations, Dyess AFB and Whiteman AFB. The EIS addresses the personnel, airfield operations, airspace and range utilization, facilities and infrastructure, and the construction of the WGF associated with the B-21 MOB 2 and MOB 3 beddown. The B-21 will operate under the direction of the Air Force Global Strike Command.

It should be noted that since the B-21 basing action is a series of beddowns, if one of the candidate bases is selected for MOB 2, then the remaining base would subsequently become the MOB 3 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in the EIS and construction activities are anticipated to

DEATH FROM ABOVE

be the same for either MOB location. Therefore, the analysis presented in the EIS represents potential impacts associated with the beddown actions at either location.

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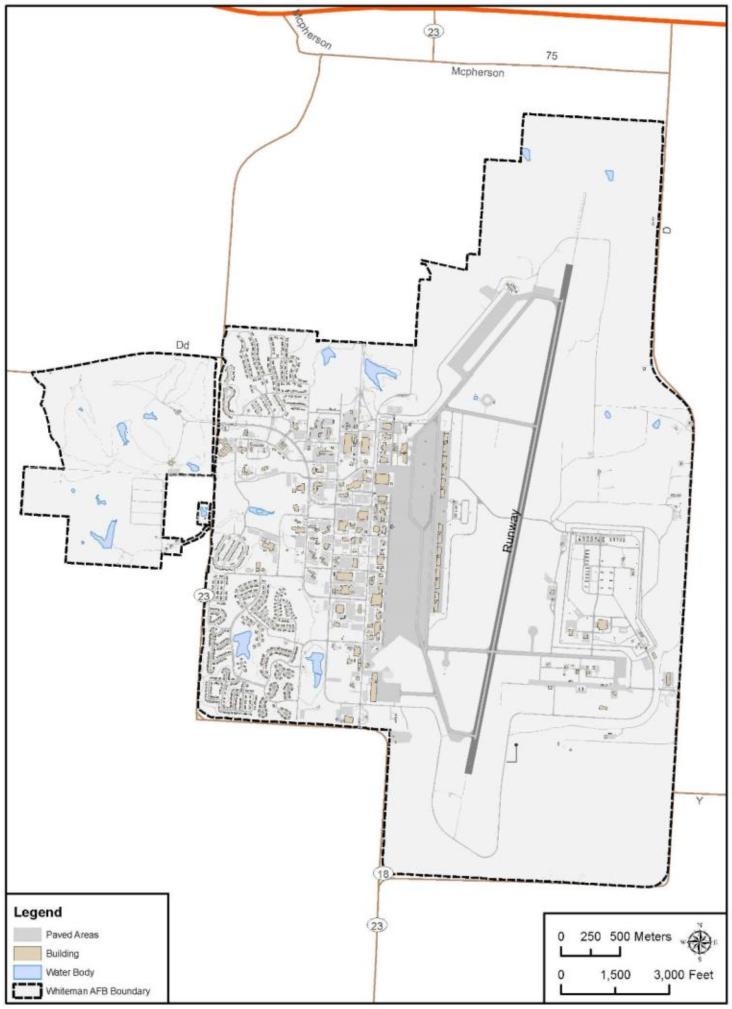

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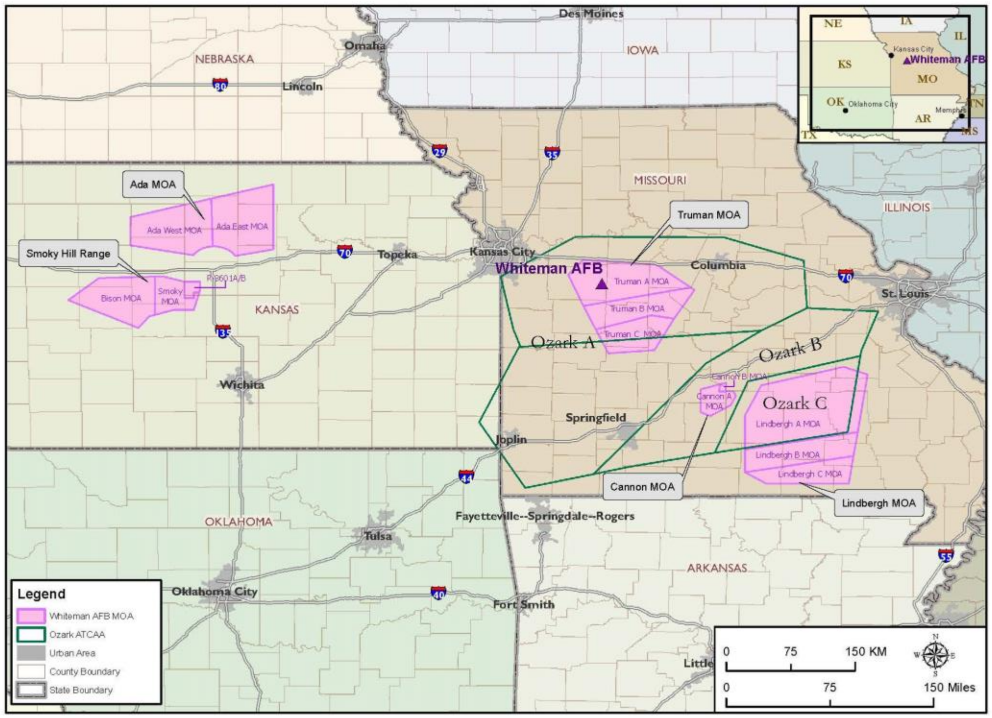

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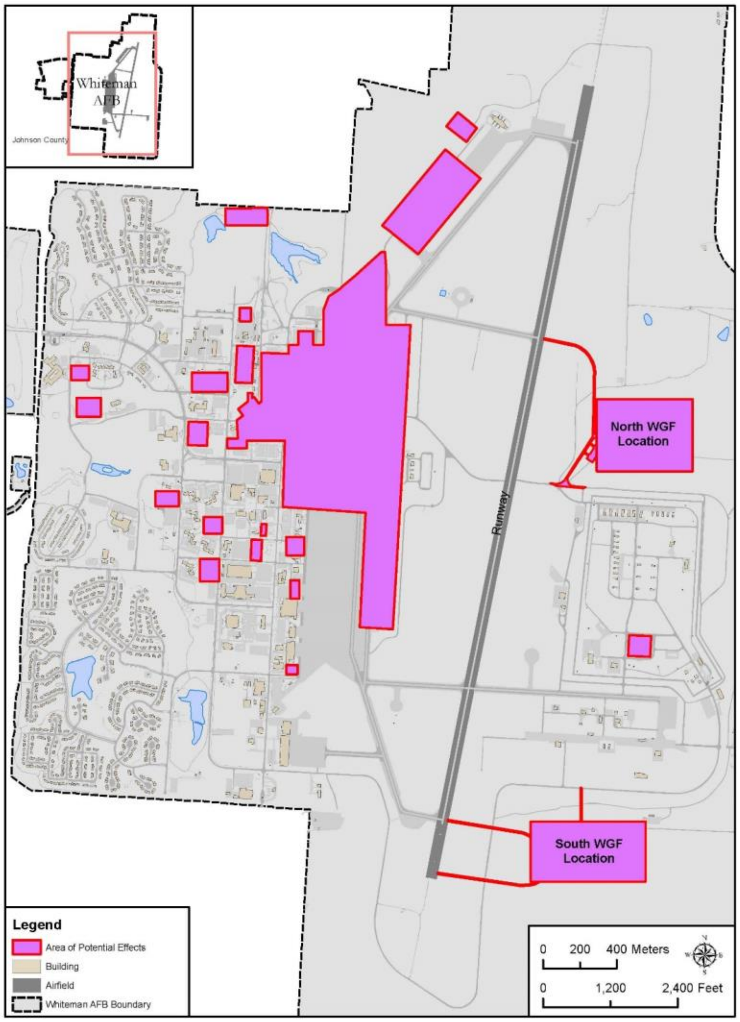

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