

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 Personal home addresses and phone numbers will not be published in the Final EIS.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 <u>www.B21EIS.com</u>.

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 This page is intentionally blank.

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ACRONYMS AND ABBREVIATIONS

1	ACAM	Air Conformity Applicability Model
2	AFB	Air Force Base
3	AICUZ	Air Installations Compatible Use Zones
4	APZs	Accident Potential Zones
5	CAA	Clean Air Act
6	CEQ	Council on Environmental Quality
7	CFR	Code of Federal Regulations
8	CZs	Clear Zones
9	dB	decibels
10	dBA	A-weighted decibels
11	DNL	day-night average sound level
12	EIS	Environmental Impact Statement
13	EPA	U.S. Environmental Protection Agency
14	ICEMAP	Installation Complex Encroachment Management Action Plan
15	MAZ	Military Airport Zone
16	NAAQS	National Ambient Air Quality Standards
17	NEI	National Emissions Inventory
18	NOI	Notice of Intent
19	PSD	Prevention of Significant Deterioration
20	ROI	Region of Influence
21	SHPO	State Historic Preservation Officer
22	SIP	State Implementation Plan
23	VOC	volatile organic compound

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APPENDIX A

PUBLIC INVOLVEMENT

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PUBLIC INVOLVEMENT AND AGENCY OUTREACH Α. 1

A.1 **NOTICE OF INTENT (NOI)** 2

A.1.1 Federal Register NOI (March 27, 2023) 3

US DOVERSMENT NORMATION GPO 18128

Federal Register/Vol. 88, No. 58/Monday, March 27, 2023/Notices

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 wi NEPA and section 106 consultation e with 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 2023, at the University of Contain 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 befores 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 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

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 15calendar 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

1

1 A.2 MAILING LISTS

2 A.2.1 Dyess AFB Mailing Lists

3 A.2.1.1 Agency and Interested Parties Mailing List

Name of Business,	Legislative			
Organization, or Agency	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

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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

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

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.

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

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

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

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

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	Коу	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

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	Мау
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

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	МсСоу
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

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.

1 A.2.1.2 Tribal Mailing List

	Table	e A-2. [Dyess AFB 1	ribal Mailing Li	ist		
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	ОК	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	ТХ	78852
Kiowa Tribe of Oklahoma	Chairman	Matthew	Komalty	P.O. Box 369	Carnegie	ОК	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	ТХ	79907

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1 A.2.2 Whiteman AFB Mailing Lists

2 A.2.2.1 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. Whi	I 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

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

I able A-3. W	niteman AFB Agency an	u mieresieu Fartie	es mannny	LISI
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

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

Name of Business, Organization, or AgencyLegislative District/Region or DepartmentGreeting LineFirst NameLast Name with SuffixMissouri House of RepresentativesDistrict 160CongressmanBenBakerMissouri House of RepresentativesDistrict 161CongressmanLaneRobertsMissouri House of RepresentativesDistrict 162CongressmanBobBromleyMissouri House of RepresentativesDistrict 163CongressmanCodySmithAudrain County-Ms.LisaSmithAudrain County-JudgeJasonLambAudrain County-CommissionerIaniWindersAudrain County-CommissionerLeslieMeyerBarry County-Ms.JudgeDavidColeBarry County-CommissionerCherryWarrenBarry County-CommissionerWarrenWarrenBarry County-CommissionerWarrenWarrenBarry County-CommissionerMakeDavidCounty Commissioners' Court-CommissionerWarrenBarry County-CommissionerMikeDavisBarry County-CommissionerWarrenBarry County-CommissionerMikeDavisBarry County-CommissionerMikeDavisBarry County-CommissionerMikeDavisBarry County <th colspan="7">Table A-3. Whiteman AFB Agency and Interested Parties Mailing List</th>	Table A-3. Whiteman AFB Agency and Interested Parties Mailing List						
RepresentativesDistrict 161CongressmanLaneRobertsMissouri House of RepresentativesDistrict 162CongressmanBobBromleyMissouri House of RepresentativesDistrict 162CongressmanCodySmithMissouri House of RepresentativesDistrict 163CongressmanCodySmithAudrain CountyMs.LisaSmithAudrain CountyMs.LisaSmithAudrain CountyCommissionerAlanWindersAudrain CountyCommissionerLeslieMeyerAudrain CountyCommissionerLeslieMeyerAudrain CountyCommissionerLeslieMeyerBarry CountyCommissionerColeBarryBarry CountyCommissionerFrankWarrenBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtMs.MarleneWainscottBarton CountyCommissionerBenReedBarton CountyCommissionerMikeDavisBarton CountyCommissionerJudgeBardBates CountyCommissionerJeffTuckerBates CountyCommissionerJinWheatleyBates CountyCommissionerKenMooneyBates		District/Region or	Greeting Line				
RepresentativesDistrict 162CongressmanBobBromleyMissouri House of RepresentativesDistrict 163CongressmanCodySmithAudrain CountyMs.LisaSmithAudrain CountyMs.LisaSmithAudrain CountyCommissionerAlanWindersAudrain CountyCommissionerTracyGrahamAudrain CountyCommissionerLeslieMeyerAudrain CountyCommissionerLeslieMeyerAudrain CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyMs.JoyceEnnisBarry CountyCommissionerWayneHendrixBarry CountyCommissionerWayneHendrixBarry CountyCommissionerWayneHendrixBarry CountyCommissionerWayneHendrixBarry CountyCommissionerWayneHendrixBarry CountyMs.KristinaCrockettCounty Commissioners' CourtMs.KristinaCrockettBarton CountyCommissionerJeffTuckerBarton CountyCommissionerJeffTuckerBates CountyCommissionerJieffTuckerBates CountyCommissionerKenMoneyBates County<		District 160	Congressman	Ben	Baker		
RepresentativesDistrict 163CongressmanCodySmithMissouri House of RepresentativesDistrict 163CongressmanCodySmithAudrain CountyMs.LisaSmithAudrain CountyCommissionerAlanWindersAudrain CountyCommissionerAlanWindersAudrain CountyCommissionerTracyGrahamAudrain CountyCommissionerLeslieMeyerBarry CountyJudgeDavidColeBarry CountyMs.JopeEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerCherryWarrenBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimMheatleyBates CountyCommissionerJimMheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrent <td></td> <td>District 161</td> <td>Congressman</td> <td>Lane</td> <td>Roberts</td>		District 161	Congressman	Lane	Roberts		
RepresentativesProvide and the second of the se		District 162	Congressman	Bob	Bromley		
Audrain CountyJudgeJasonLambAudrain CountyCommissionerAlanWindersAudrain CountyCommissionerTracyGrahamAudrain CountyCommissionerLeslieMeyerBarry CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBenton CountyCommissionerSeveDaleskeBenton County <td< td=""><td></td><td>District 163</td><td>Congressman</td><td>Cody</td><td>Smith</td></td<>		District 163	Congressman	Cody	Smith		
Audrain CountyCommissionerAlanWindersAudrain CountyCommissionerTracyGrahamAudrain CountyCommissionerLeslieMeyerBarry CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJudgeMikeDavisBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBenton CountyMs.SusanPorterfieldB	Audrain County		Ms.	Lisa	Smith		
Audrain CountyCommissionerTracyGrahamAudrain CountyCommissionerLeslieMeyerBarry CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtCommissionerBenReedBarton CountyCommissionerBenReedBarton CountyMs.MarleneWainscottBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBenton County<	Audrain County		Judge	Jason	Lamb		
Audrain CountyCommissionerLeslieMeyerBarry CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerImWheatleyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBenton CountyCommissionerTrentNelsonBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton County-	Audrain County		Commissioner	Alan	Winders		
Barry CountyJudgeDavidColeBarry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerImWheatleyBates CountyCommissionerTrentNelsonBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMolesonBates CountyCommissionerKenMolesonBates CountyMs.Su	Audrain County		Commissioner	Tracy	Graham		
Barry CountyMs.JoyceEnnisBarry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBenton CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton County	Audrain County		Commissioner	Leslie	Meyer		
Barry CountyCommissionerCherryWarrenBarry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerBenReedBatso CountyMs.MarleneWainscottBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBenton CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton County<	Barry County		Judge	David	Cole		
Barry CountyCommissionerWayneHendrixBarry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMelsonBates CountyCommissionerKenMooneyBates CountyCommissionerKenMelsonBates CountyCommissionerKenMelsonBenton CountyCommissionerSusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton Coun	Barry County		Ms.	Joyce	Ennis		
Barry CountyCommissionerFrankWashburnCounty Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMelsonBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMelsonBates CountyCommissionerKenMelsonBenton CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton County	Barry County		Commissioner	Cherry	Warren		
County Commissioners' CourtMs.KristinaCrockettCounty Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyJudgeM BrandonBakerBates CountyCommissionerJimWheatleyBates CountyCommissionerTrentNesonBates CountyCommissionerTrentNelsonBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Barry County		Commissioner	Wayne	Hendrix		
County Commissioners' CourtJudgeDavidMuntonBarton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyMs.MarleneMainscottBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBates CountyMs.SusanPorterfieldBates CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Barry County		Commissioner	Frank	Washburn		
Barton CountyCommissionerMikeDavisBarton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyJudgeM BrandonBakerBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBenton CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyMs.Brianna LLennon	County Commissioners' Court		Ms.	Kristina	Crockett		
Barton CountyCommissionerBenReedBarton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyJudgeM BrandonBakerBates CountyCommissionerJimWheatleyBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBates CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	County Commissioners' Court		Judge	David	Munton		
Barton CountyCommissionerJeffTuckerBates CountyMs.MarleneWainscottBates CountyJudgeM BrandonBakerBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBates CountyMs.SusanPorterfieldBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyMs.Brianna LLennon	Barton County		Commissioner	Mike	Davis		
Bates CountyMs.MarleneWainscottBates CountyJudgeM BrandonBaker BrandonBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyMs.Brianna LLennon	Barton County		Commissioner	Ben	Reed		
Bates CountyJudgeM BrandonBakerBates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBates CountyCommissionerTrentNelsonBates CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Barton County		Commissioner	Jeff	Tucker		
Bates CountyCommissionerJimWheatleyBates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBenton CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyMs.BerryBerryBoone CountyMs.Brianna LLennon	Bates County		Ms.	Marlene	Wainscott		
Bates CountyCommissionerKenMooneyBates CountyCommissionerTrentNelsonBenton CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerScottHarmsBenton CountyMs.ScottLarryBenton CountyMs.Brianna LLennon	Bates County		Judge		Baker		
Bates CountyCommissionerTrentNelsonBenton CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Bates County		Commissioner	Jim	Wheatley		
Benton CountyMs.SusanPorterfieldBenton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Bates County		Commissioner	Ken	Mooney		
Benton CountyJudgeM BrandonBakerBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Bates County		Commissioner	Trent	Nelson		
Benton CountyCommissionerBrandonBenton CountyCommissionerSteveDaleskeBenton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Benton County		Ms.	Susan	Porterfield		
Benton CountyCommissionerScottHarmsBenton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Benton County		Judge		Baker		
Benton CountyCommissionerLarryBerryBoone CountyMs.Brianna LLennon	Benton County		Commissioner	Steve	Daleske		
Boone County Ms. Brianna L Lennon	Benton County		Commissioner	Scott	Harms		
	Benton County		Commissioner	Larry	Berry		
Boone County Judge Hasbrouck Jacobs	Boone County		Ms.	Brianna L	Lennon		
	Boone County		Judge	Hasbrouck	Jacobs		

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

Table A-3. Whi	teman AFB Agency and		es manning	LISI
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

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

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

I able A-3. Wh	teman AFB Agency and	Interested Partie	es mainny	LISI
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

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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. Wh	iteman AFB Agency an	d Interested Parti	es Mailing	g 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

Table A-3. Whiteman AFB 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	
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	

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

Table A-3. Whi	teman AFB Agency and	interested Parti	es 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

Table A-3. Wh	teman AFB Agency an	iu interesteu Parti		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	

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

Legislative Name of Business. Last Name First **District/Region or Greeting Line** Name with Suffix **Organization, or Agency** Department White Saline County Commissioner Michael J --Saline County Ms. Debbie Russell --Rolf Saline County Judge Dennis --Saline County --Commissioner Kile Jr Guthrey Saline County Commissioner Monte Fenner --Gooden Saline County --Commissioner Stephanie Ms. Bland Shannon County Shelly --Shannon County Privette --Judge Steven Shannon County Cowen Commissioner Jeff --Shannon County Kelly Commissioner Herman --Shannon County Counts ---Commissioner Dale 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 Smith --Randy Stone County Ms. Dickens --Denise Stone County Cole --Judge David Stone County Mark Maples --Commissioner Stone County Blades Commissioner Wayne --Commissioner Stone County Smythe Hank --Taney County Ms. Donna --Neeley

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

-				-
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
	1	1	1	1

Judge

Ms.

Commissioner

Commissioner

Commissioner

Taney County

Taney County

Taney County

Taney County

Texas County

--

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--

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Jeffrey

Brandon

Sheila

Peggy

Mike

Merrell

Scofield

Williams

Wyatt

Sevler

Table A-3. Whiteman AFB 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	
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.	Тасу	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	

Legislative Name of Business. Last Name First **District/Region or Greeting Line** Name with Suffix **Organization, or Agency** Department **Rice County** Commissioner David --Terry 20th Judicial District Court Judge Carev 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 Cross ---Judge Andrea 20th Judicial District Court Judge Svaty ---Peggy City of Knob Noster Ward 3 Alderman Liechti Alderman Benjamin City of Knob Noster Ward 3 Alderman Alderman Tom Brent City of Knob Noster Ward 2 Alderman Alderman Stauffer-Jesse 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 Hills Mr. Paul --City of Warrensburg Mayor Jim Kushner --City of Warrensburg Tarl ---Mr. Bentley City of Warrensburg Council Member Lund --Casev Council Member Uhler City of Warrensburg ---Bruce City of Warrensburg Council Member Eddie Osborne --City of Sedalia Dawson Mayor Andrew --City of Sedalia Sedalia City Council, Council Member Oldham Tom Ward 1 City of Sedalia Sedalia City Council, Council Member Jack Robinson Ward 1 City of Sedalia Sedalia City Council, Council Member Chris Marshall Ward 2 Sedalia City Council, **Council Member** City of Sedalia Tina Boggess Ward 2 City of Sedalia Sedalia City Council, Council Member Bob Cross Ward 3 Sedalia City Council, Council Member Hiller City of Sedalia Bob Ward 3 Sedalia City Council, City of Sedalia Council Member Rhiannon Foster Ward 4

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

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

Table A-3. Whit	eman AFB Agency and	Interested Partie	es maning	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	nson County Military Airport Military Airport Zoning Ing Commission Board		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.

1 A.2.2.2 Tribal Mailing List

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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

1 A.3 SCOPING LETTER

2 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

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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)

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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 30minute 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 <u>www.B21EIS.com</u>. 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

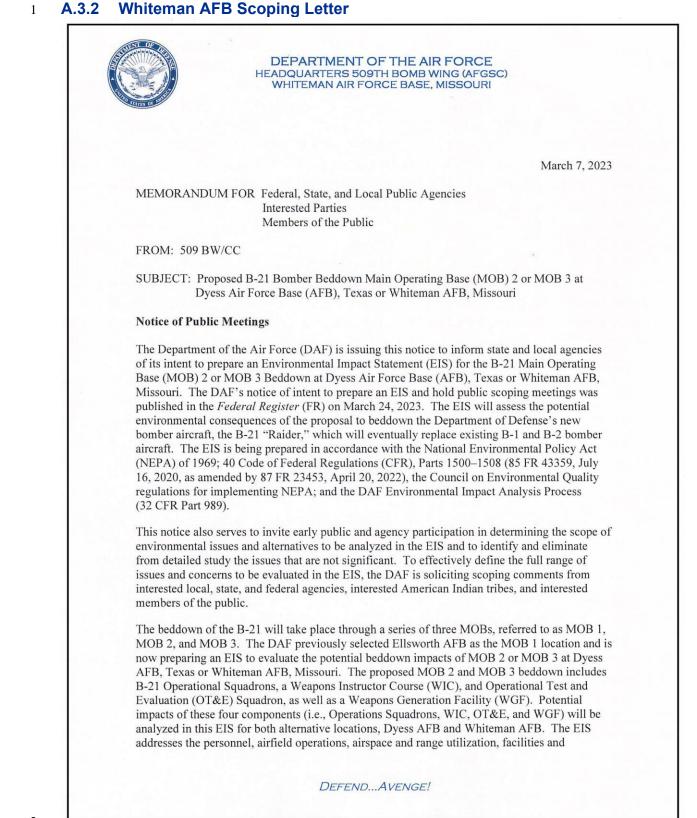
Additional information on the EIS and the environmental impact analysis process can be found on the project website at www.B21EIS.com. Written comments can be submitted at a public scoping meeting, through the project website, or by mailing them to: Leidos, ATTN: B-21 EIS, 12304 Morganton Hwy #572, Morganton, 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.

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JOSEPH K. KRAMER, Colonel, USAF Commander



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,

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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 (<u>www.B21EIS.com</u>), 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.

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- 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
- 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 <u>www.B21EIS.com</u>. 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.

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DANIEL C. DIEHL, Colonel, USAF Commander A.3.3

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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

Scoping Period Extension Notification Letter

can be submitted at any time during the in-person scoping meetings or submitted electronically via the public website at <u>www.B21EIS.com</u>.

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 <u>www.B21EIS.com</u>. 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
- 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
- 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 <u>www.B21EIS.com</u>. 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.

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CHRASTOPHER MOORE, USAF Program Manager, AFCEC NEPA Division

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1 A.4 PUBLIC SCOPING SUBSTANTIVE COMMENT LETTERS

2 Substantive comment letters received during the public scoping period are listed in

- 3 Table A-5. Please note that the comments are presented exactly as they were submitted.
- 4

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.

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or Whiten	nan AFB	/			
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ENVIRONM	IENTAL IN	IPACT ST	ATEMENT		0 8 8 8
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			Johningh		4/25/23
	er, only the names of	f the individuals mak	ting comments and s		dividuals requesting copies included in the Draft EIS.
or that identify poten express a conclusion	tial impacts, reaso , an opinion, a vot or opinion. THANK	onable alternatives te for or against th (YOU FOR YOUR	, or feasible mitiga e proposed action	tion. Non-substantive or a particular alterna	r study in the Draft EIS; comments are those that tive, or otherwise state a "MARKED BY May 10, 2023
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All comments will be ful	y considered in the D	Draft EIS without prov	viding a full address.		

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** 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 All The Industrial cared Pent properties a 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



May 2, 2023

Mr. Christopher Moore, DAF Air Force Civil Engineer Center

National Environmental Policy Action Division

Life's better outside."

Commissioners

Arch "Beaver" Aplin, III Chairman Lake Jackson

> Dick Scott Vice-Chairman Wimberley

James E. Abell Kilgore

> Oliver J. Bell Cleveland

Paul L. Foster El Paso

Anna B. Galo Laredo

Jeffery D. Hildebrand Houston

Robert L. "Bobby" Patton, Jr. Fort Worth

Travis B. "Blake" Rowling Dallas

> Lee M. Bass Chairman-Emeritus Fort Worth

T. Dan Friedkin Chairman-Emeritus Houston

David Yoskowitz, Ph.D. Executive Director

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

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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.

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

	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
<i>x</i>	

APPENDIX B

AIR QUALITY CALCULATIONS

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B-1

B. AIR QUALITY CALCULATIONS

2 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)

4 Environmental Impact Statement (EIS).

5 B.1 AIR QUALITY PROGRAM OVERVIEW

To protect public health and welfare, the U.S. Environmental Protection Agency (EPA) 6 has developed numerical concentration-based standards, or National Ambient Air Quality 7 Standards (NAAQS), for six "criteria" pollutants (based on health-related criteria) under 8 the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: primary 9 and secondary standards. Primary standards prescribe the maximum permissible 10 concentration in the ambient air to protect public health, including the health of "sensitive" 11 populations such as asthmatics, children, and the elderly. Secondary standards prescribe 12 the maximum concentration or level of air quality required to protect public welfare, 13 including protection against decreased visibility, damage to animals, crops, vegetation, 14 and buildings (40 Code of Federal Regulations [CFR] 50). 15 The CAA gives states the authority to establish air quality rules and regulations. These 16 rules and regulations must be equivalent to, or more stringent than, the federal program. 17

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 22 on measured ambient air pollutant concentrations, EPA designates areas of the United 23 States as having air quality better than the NAAQS (attainment), worse than the NAAQS 24 (nonattainment), and unclassifiable. The areas that cannot be classified (on the basis of 25 available information) as meeting or not meeting the NAAQS for a particular pollutant are 26 "unclassifiable" and are treated as attainment areas until proven otherwise. Attainment 27 28 areas can be further classified as "maintenance" areas, which are areas previously classified as nonattainment areas but where air pollutant concentrations have been 29 successfully reduced to levels below the standard. Maintenance areas are subject to 30 special maintenance plans and must operate under some of the nonattainment area plans 31 32 to ensure compliance with the NAAQS. Both Taylor County, Texas, and Johnson County, Missouri, are currently in attainment for all criteria pollutants (EPA, 2023a). 33

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. B-2

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

Table B-1. Summary of National Amblent All Quality Standards					
Pollu	tant	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/m ^{3 (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
	PM _{2.5}	primary	1 year	12 µg/m³	annual mean, averaged over 3 years
Particle Pollution (PM)		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: \leq = less than or equal to; μ g/m³ = micrograms per cubic meter; CO = carbon monoxide; O₃ = ozone; NAAQS = National Ambient Air Quality Standards; NO₂ = nitrogen dioxide; Pb = lead; PM_{2.5} = particulate matter with a diameter less than or equal to 2.5 microns; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppb = parts per billion; ppm = parts per million; SO₂ = 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 guarter average) also remain in effect.

b. The level of the annual NO₂ 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 SO₂ 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 SO₂ standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO₂ 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.

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Emission Rate Pollutant (Tons/Year) Ozone (VOCs or NO_x) Serious nonattainment areas 50 25 Severe nonattainment areas Extreme nonattainment areas 10 Other ozone nonattainment areas outside an ozone transport region 100 VOC 50 NOx 100 CO: all nonattainment areas 100 SO₂ or NO₂: all nonattainment areas 100 **PM**₁₀ Moderate nonattainment areas 100 Serious nonattainment areas 70 PM_{2.5} (direct emissions, SO₂, NO_x, VOC, and ammonia) Moderate nonattainment areas 100 Serious nonattainment areas 70 Pb: all nonattainment areas 25

Table B-2. Emission Rates for Criteria Pollutants in Nonattainment Areas ^(a)

Source: (EPA, 2023c)

Key: CO = carbon monoxide; NO₂ = nitrogen dioxide; NO_x = nitrogen oxides; Pb = lead; PM_{2.5} = particulate matter with a diameter less than or equal to 2.5 microns; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; SO₂ = 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.

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Each state is required to develop a State Implementation Plan (SIP) that sets forth how 1 CAA provisions will be imposed within the state. The SIP is the primary means for the 2 implementation, maintenance, and enforcement of the measures needed to attain and 3 maintain the NAAQS within each state and includes control measures, emissions 4 limitations, and other provisions required to attain and maintain the ambient air quality 5 standards. The purpose of the SIP is twofold. First, it must provide a control strategy 6 that will result in the attainment and maintenance of the NAAQS. Second, it must 7 demonstrate that progress is being made in attaining the standards in each 8 9 nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and 10 in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure 11 that these sources are constructed without causing significant adverse deterioration of 12 the clean air in the area. A major new source is defined as one that has the potential to 13 emit any pollutant regulated under the CAA in amounts equal to or exceeding specific 14 major source thresholds, that is, 100 or 250 tons per year based on the source's 15 industrial category. A major modification is a physical change or change in the method 16 of operation at an existing major source that causes a significant "net emissions 17 increase" at that source of any regulated pollutant. Table B-4 lists the PSD significant 18 emissions rate thresholds for selected criteria pollutants (40 CFR Part 51.166). 19

20 21

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

Pollutant	Significant Emissions Rate (Tons/Year)
PM ₁₀	15
PM _{2.5}	10
Total suspended particulates	25
SO ₂	40
NOx	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 22 existing air guality; (2) protect public health and welfare from adverse effects that might 23 occur even at pollutant levels better than the NAAQS; and (3) preserve, protect, and 24 enhance the air quality in areas of special natural recreational, scenic, or historic value, 25 such as national parks and wilderness areas. Sources subject to PSD review are 26 required by the CAA to obtain a permit before commencing construction. The permit 27 process requires an extensive review of all other major sources within a 50-mile radius 28 and all Class I areas within a 62-mile radius of the facility. Emissions from any new or 29 modified source must be controlled using best available control technology. The air 30 31 guality, 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 32 wilderness areas are designated as Class I areas, where any appreciable deterioration 33

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

3 industrial development.

Pollutant	Averaging	Maximum Allowable Concentration (µg/m ³)		
Foliulani	Time	Class I	Class II	Class III
PM ₁₀	Annual	4	17	34
FIVI10	24-hour	8	30	60
	Annual	2	20	40
SO ₂	24-hour	5	91	182
	3-hour	25	512	700
NO ₂	Annual	2.5	25	50

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

Source: Title 40 CFR Part 51

Key: NO₂ = nitrogen dioxide; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; PSD = Prevention of Significant Deterioration; SO₂ = sulfur dioxide; μg/m³ = micrograms per cubic meter

4 The Ambient Monitoring Program measures levels of air pollutants throughout the state.

5 The data are used to determine compliance with air standards established for five

6 compounds and evaluate the need for special controls for various other pollutants.

7 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

9 levels to be in attainment with the standards. Also included are areas where the ambient

10 standards are being met, but plans are necessary to ensure maintenance of acceptable

¹¹ 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.

17 **B.2 REGULATORY COMPARISONS**

To evaluate air emissions and their impact on the overall region of influence (ROI), the 18 emissions associated with the Proposed Action activities were evaluated in accordance 19 with the tiered approach outlined in the Air Force Air Quality Environmental Impact 20 Analysis Process (EIAP) Guide – Fundamentals, Volume I and Volume II – Advanced 21 22 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 23 24 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 25 completed. The Tier II assessment requires a formal evaluation of air impacts based on 26 a quantitative net change emission inventory of the annual net total direct and indirect 27 emissions of pollutants of concern. 28

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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.

8 However, since the majority of the emissions related to the Proposed Action and 9 alternatives would result from activities associated with mobile sources, a second-level 10 indicator was deemed appropriate. Consequently, each pollutant was also evaluated and 11 compared with the total ROI emissions on a pollutant-by-pollutant basis against the ROI's 12 2017 National Emissions Inventory (NEI) data.

- Potential impacts to air quality are evaluated with respect to the extent, context, and 13 intensity of the impact in relation to relevant regulations, guidelines, and scientific 14 documentation. The Council on Environmental Quality (CEQ) defines significance in 15 terms of context and intensity in 40 CFR 1508.27. This requires that the significance of 16 the action must be analyzed with respect to the setting of the Proposed Action and based 17 relative to the severity of the impact. The CEQ National Environmental Policy Act 18 19 Regulations (40 CFR 1508.27(b)) provide 10 key factors to consider in determining an impact's intensity. 20
- *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.
- 27 (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.

1 (7) Whether the action is related to other actions with individually 2 insignificant but cumulatively significant impacts. Significance exists if it is 3 reasonable to anticipate a cumulatively significant impact on the 4 environment. Significance cannot be avoided by terming an action 5 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.

15 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 16 ROIs instead of the EPA-designated Air Quality Control Regions, which are much larger 17 areas. Air quality impacts would be considered significant if the increases in annual 18 emissions of a pollutant would be anticipated to: (1) cause or contribute to a violation of 19 any national or state ambient air quality standard; (2) expose sensitive receptors to 20 substantially increased pollutant concentrations; (3) exceed any evaluation criteria 21 22 established by a SIP or permit limitations/requirements; or (4) be anticipated to cause an 23 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).

31 B.3 NATIONAL EMISSIONS INVENTORY

The NEI is operated under the EPA's Emission Factor and Inventory Group, which 32 prepares the national database of air emissions information with input from numerous 33 state and local air agencies, tribes, and industries. The database contains information on 34 stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants. 35 The database includes estimates of annual emissions, by source, of air pollutants in each 36 area of the country on a yearly basis. The NEI includes emission estimates for all 50 37 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates 38 for individual point or major sources (facilities), as well as county-level estimates for area, 39

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- 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.
- 4 Criteria air pollutants are those for which the EPA has set health-based standards. Four 5 of the six criteria pollutants are included in the NEI database:
- 6 Carbon monoxide
- 7 Nitrogen oxides
- 8 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).
- 28 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.

4 **B.4 PROJECT CALCULATIONS**

5 This appendix presents an export of results directly from the air quality modeling software,

⁶ retaining the organizational headings, text, and table formatting produced by the software.

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

8 **1. General Information**

9	
10	- Action Location
11	Base: DYESS AFB
12	State: Texas
13	County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
14	Regulatory Area(s): NOT IN A REGULATORY AREA
15	
16	- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base

- 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.

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- 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

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1 well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support and 2 conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the B 21 3 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities 4 would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2 5 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air 6 operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS 7 and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis 8 presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown 9 actions for either location. 10 11 The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either

rife rioposed 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.

23 - Point of Contact

24	Name:	Brad Boykin
25	Title:	CTR
26	Organization:	Leidos
27	Email:	boykinb@leidos.com
28	Phone Number:	571-521-8765
29		

30 - 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	

31

22

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

- 34 Air Force Transitory Sources.
- 35 36

37 **2. Personnel**

38
39
40
41 - Add or Remove Activity from Baseline? Add

```
4243 - Activity Location
```

44 **County:** Taylor

Emissions Per Year (TONs)
0.015642
0.000000
0.102566
1448.6

Regulatory A	rea(s):	NOT IN A REG	ULATORY	AREA	
- Activity Title:	Personne	el - Military			
- Activity Descript	ion:				
Military - 695					
• Activity Start Da	te				
Start Month:	1				
Start Year:	2025				
- Activity End Dat	е				
Indefinite:	Yes				
End Month:	N/A				
End Year:	N/A				
- Activity Emission	15.				
Pollutant		ons Per Year (T	ONs)	Poll	utant
VOC		1.004025		PM 2.5	
SO _x		0.010439		Pb	
NO _x		0.592392		NH ₃	
CO		14.179602		CO ₂ e	
PM 10 2.2 Personnel As		0.018274			
Support Cont Air National (Reserve Perso	Guard (A	rsonnel: NG) Personnel:	0 0 0		
- Default Settings	Used:	Yes			
- Average Personn	el Round	l Trip Commute	(mile):	20 (default)	
- Personnel Work	Schedule	1			
Active Duty P			5 Days	Per Week (defa	ault)
Civilian Perso	nnel:		5 Days	Per Week (defa	ault)
				Per Week (defa	
Support Cont		N((1) D	4 Davs	Per Week (defa	
Air National (NG) Personnel:		Dan Ma	
		NG) Personnel:		Per Month (det	fault)
Air National (Reserve Perso	nnel:		4 Days	Per Month (det	fault)
Air National (Reserve Perso 2.3 Personnel O	nnel: n Road '	Vehicle Mixtur	4 Days	Per Month (det	fault)
Air National (Reserve Perso 2.3 Personnel O - On Road Vehicle	nnel: n Road '	Vehicle Mixtur	4 Days	Per Month (der	
Air National (Reserve Perso 2.3 Personnel O - On Road Vehicle POVs	nnel: n Road ` Mixture	Vehicle Mixtur	4 Days		fault)

- On Road Vehicle Emission Factors (grams/mile)								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024

43

HDDV

0

3.11

MC

1.9

0

CO₂e

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

1

B-12

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/ye	ar)
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} + V	лт

$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$
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
5.1 General Information & Timenne Assumptions
- Add or Remove Activity from Baseline? Remove
- Add of Remove Activity from Dasenne: Remove
Activity Location
- Activity Location
County: Taylor Deceletory Area(a): NOT IN A DECUL ATODY ADEA
Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Personnel - Civilian and Contractor
- Activity Flux, I Cisoline - Civilian and Contractor
- Activity Description:
Civilian - 46
Civilian - 40

47 Contractor - 50

				INC	
- Activity Start Da					
Start Month:	1				
Start Year:	2025				
- Activity End Dat					
Indefinite:	Yes				
End Month:	N/A				
End Year:	N/A				
- Activity Emission	18:				
Pollutant	Emissions Per Year (TO	Ns)	Pollutant	Emissions Per Y	ear (TO
VOC	-0.138685		PM 2.5	-0.0021	161
SO _x	-0.001442		Pb	0.0000	00
NO _x	-0.081827		NH ₃	-0.0141	167
СО	-1.958621		CO ₂ e	-200.	1
PM 10	-0.002524				
	ractor Personnel: Guard (ANG) Personnel:	50 0			
Reserve Perso		0			
- Default Settings	Used: Yes				
- Average Personn	el Round Trip Commute ((mile): 20	(default)		
- Personnel Work	Schedule				
Active Duty P		5 Davs Pe	Week (default)		
Civilian Perso			Week (default)		
	ractor Personnel:		Week (default)		
	Guard (ANG) Personnel:		Week (default)		
Reserve Perso		•	Month (default)		
3.3 Personnel O	n Road Vehicle Mixture	•			
- On Road Vehicle	Mixture (%)				
		IIDON	IDDV ID		14

	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

35 36

3.4 Personnel Emission Factor(s)

37 38

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
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

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	MC 002.758 000.003 000.620 012.221 000.023 000.020 000.054 00389.005						
1							
2	3.5 Personnel Formula(s)						
3							
4	- Personnel Vehicle Miles Travel for Work Days per Year						
5	$VMT_P = NP * WD * AC$						
6	VMT _P : Personnel Vehicle Miles Travel (miles/year)						
7	NP: Number of Personnel						
8	WD: Work Days per Year						
9 10	AC: Average Commute (miles)						
10	- Total Vehicle Miles Travel per Year						
12	$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$						
12	VIII IUM – VIII AD – VIII AC – VIII ANG – VIII ARG						
14	VMT _{Total} : Total Vehicle Miles Travel (miles)						
15	VMT _{AD} : Active Duty Personnel Vehicle Miles Travel (miles)						
16	VMT _C : Civilian Personnel Vehicle Miles Travel (miles)						
17	VMT _{SC} : Support Contractor Personnel Vehicle Miles Travel (miles)						
18	VMT _{ANG} : Air National Guard Personnel Vehicle Miles Travel (miles)						
19	VMT _{AFRC} : Reserve Personnel Vehicle Miles Travel (miles)						
20	X7. L.S. L. Franker Street						
21 22	- Vehicle Emissions per Year V _{POL} = (VMT _{Total} * 0.002205 * EF _{POL} * VM) / 2000						
22	$v_{POL} = (v_{1V11}_{Total} + 0.002203 + EFPOL + v_{1V1}) / 2000$						
23 24	V _{POL} : Vehicle Emissions (TONs)						
25	VMT _{Total} : Total Vehicle Miles Travel (miles)						
26	0.002205: Conversion Factor grams to pounds						
27	EF _{POL} : Emission Factor for Pollutant (grams/mile)						
28	VM: Personnel On Road Vehicle Mixture (%)						
29	2000: Conversion Factor pounds to tons						
30							
31							
32	4. Aircraft						
33							
34	4.1 General Information & Timeline Assumptions						
35							
36	- Add or Remove Activity from Baseline? Add						
37 38	- Activity Location						
39	County: Taylor						
40	Regulatory Area(s): NOT IN A REGULATORY AREA						
41							
42	- Activity Title: B-21						
43							
44	- Activity Description:						
45	1,140 annual LTOs						
46	A stimiter Start Data						
47	- Activity Start Date						
48 49	Start Month: 1 Start Year: 2025						
49 50							
51	- Activity End Date						
52	Indefinite: Yes						
53	End Month: N/A						
DRAFT	ENVIRONMENTAL IMPACT STATEMENT						

End Year: N/A

- Activity Emissions:

- Activity Emissions.						
Pollutant	Emissions Per Year (TONs)					
VOC	5.620168					
SO _x	9.627475					
NO _x	147.498209					
СО	63.257429					
PM 10	15.164314					

Pollutant	Emissions Per Year (TONs)
PM 2.5	13.427448
Pb	0.000000
NH ₃	0.000000
CO ₂ e	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
СО	42.622448
PM 10	12.741708

Pollutant	Emissions Per Year (TONs)
PM 2.5	11.103008
Pb	0.000000
NH ₃	0.000000
CO ₂ e	17844.6

4.2 Aircraft & Engines

89 4.2.1 Aircraft & Engines Assumptions

10 - Aircraft & Engine

- All Claft & Elignic	
Aircraft Designation:	B-2A
Engine Model:	F118-GE-100
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4
- Aircraft & Engine Surrogat Is Aircraft & Engine a Su Original Aircraft Name: Original Engine Name:	

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

4.2.2 Aircraft & Engines Emission Factor(s)

This ci ait of Li		ino i accorb		uci)				
	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e
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 Operations27

4.3.1 Flight Operations Assumptions

29			
30	- Flight Operations		
31	Number of Aircraft:		12
32	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
33	Number of Annual Flight Operation C	ycles for all Aircraft:	1140
34	Number of Annual Trim Test(s) per Ai	rcraft:	12
35			

36 - Default Settings Used: No

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	NOVEMBER 2023
1	
2	- Flight Operations TIMs (Time In Mode)
3	Taxi [Idle] (mins): 22.66
4	Approach [Approach] (mins): 7.37 Climb Out [Intermediate] (mins): 1.41
5	Climb Out [Intermediate] (mins): 1.41
6	Takeoff [Military] (mins):1.06
7	Takeoff [After Burn] (mins): 0
8	
9	Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with
10	after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2
11	flight profile was used)
12	
13	- Trim Test
13	Idle (mins): 12
15	Approach (mins): 27
16	Intermediate (mins): 9
17	Military (mins): 12
18	AfterBurn (mins): 0
19	
20	4.3.2 Flight Operations Formula(s)
21	_ .
22	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
23	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
24	$M_{\rm emp} = (M_{\rm em} / 60) (10 / 1000) E M_{\rm em} = 100 / 2000$
24	AEM . Aircroft Emissions nor Dollutont & Mode (TONs)
	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)
26	TIM: Time in Mode (min)
27	60: Conversion Factor minutes to hours
28	FC: Fuel Flow Rate (lb/hr)
29	1000: Conversion Factor pounds to 1000pounds
30	EF: Emission Factor (lb/1000lb fuel)
31	NE: Number of Engines
32	FOC: Number of Flight Operation Cycles (for all aircraft)
33	2000: Conversion Factor pounds to TONs
34	-
35	- Aircraft Emissions for Flight Operation Cycles per Year
36	$AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
37	TEPOL - TEMIDLE_IN + TEMIDLE_UUT + TEMAPPROACH + TEMICLIMBOUT + TEMITAKEOPP
38	AE _{FOC} : Aircraft Emissions (TONs)
38 39	AE _{FOC} . Ancraft Emissions (TONS) AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)
40	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
41	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
42	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
43	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
44	
45	- Aircraft Emissions per Mode for Trim per Year
46	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
47	
48	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
49	TD: Test Duration (min)
50	60: Conversion Factor minutes to hours
51	FC: Fuel Flow Rate (lb/hr)
52	1000: Conversion Factor pounds to 1000pounds
52 53	
	EF: Emission Factor (lb/1000lb fuel)
54	NE: Number of Engines
55	NA: Number of Aircraft

- NTT: Number of Trim Test
- 2 2000: Conversion Factor pounds to TONs 3

4 - Aircraft Emissions for Trim per Year

5 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$ 6

- 7 AE_{TRIM}: Aircraft Emissions (TONs)
- 8 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs)
- 9 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)
- 10 AEPSINTERMEDIATE: Aircraft Emissions 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) 14

4.4.1 Auxiliary Power Unit (APU) Assumptions 16

18 - Default Settings Used: Yes

20 - Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
2	4	No	131-3A	

21

1

11 12

13

15

17

19

22

25

27

31

23 24

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 ₂ e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

26 4.4.3 Auxiliary Power Unit (APU) Formula(s)

28 - Auxiliary Power Unit (APU) Emissions per Year

29 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$ 30

- APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
- 32 APU: Number of Auxiliary Power Units
- 33 OH: Operation Hours for Each LTO (hour)
- 34 LTO: Number of LTOs 35
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons

4.5 Aircraft Engine Test Cell 38

39 40

36 37

41

4.5.1 Aircraft Engine Test Cell Assumptions

42			
43	- Engine Test Cell		
44	Total Number of Airc	raft Engines Tested Annually:	48
45			
46	- Default Settings Used:	No	
47	-		

B-18 NOVEMBER 2023 1 - Annual Run-ups / Test Durations 2 **Annual Run-ups (Per Aircraft Engine):** 1 3 **Idle Duration (mins):** 12 4 Approach Duration (mins): 27 5 **Intermediate Duration (mins):** 9 6 **Military Duration (mins):** 12 7 After Burner Duration (mins): 0 8 9 4.5.2 Aircraft Engine Test Cell Emission Factor(s) 10 11 - See Aircraft & Engines Emission Factor(s) 12 **4.5.3** Aircraft Engine Test Cell Formula(s) 13 14 15 - Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) 16 $\text{TestCellPS}_{\text{POL}} = (\text{TD} / 60) * (\text{FC} / 1000) * \text{EF} * \text{NE} * \text{ARU} / 2000$ 17 18 TestCellPS_{POL}: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) 19 TD: Test Duration (min) 20 60: Conversion Factor minutes to hours 21 FC: Fuel Flow Rate (lb/hr) 1000: Conversion Factor pounds to 1000pounds 22 EF: Emission Factor (lb/1000lb fuel) 23 24 NE: Total Number of Engines (For All Aircraft) 25 ARU: Annual Run-ups (Per Aircraft Engine) 26 2000: Conversion Factor pounds to TONs 27 28 - Aircraft Engine Test Cell Emissions per Year 29 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + Test$ 30 TestCellPS_{AFTERBURN} 31 32 TestCell: Aircraft Engine Test Cell Emissions (TONs) 33 TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) 34 35 TestCellPSINTERMEDIATE: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) 36 TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) 37 TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs) 38 39 4.6 Aerospace Ground Equipment (AGE) 40 41 4.6.1 Aerospace Ground Equipment (AGE) Assumptions 42 43 - Default Settings Used: Yes 44 45 - AGE Usage 46 Number of Annual LTO (Landing and Take-off) cycles for AGE: 1140 47 48 - Aerospace Ground Equipment (AGE) (default) **Total Number of Operation Hours** Exempt **AGE Type** Designation AGE for Each LTO Source? No Air Compressor MC-1A - 18.4hp 1 1.5 12 Air Conditioner Ace 401 1 No MJ-40 1 2 No Bomb Lift 3 Generator Set A/M32A-86D 1 No

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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	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
	Flow							
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 (TC

- 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

24	- Activity Location	
25	County: Taylor	
26	Regulatory Area(s): NOT IN A REGULATORY AREA
27		
28	- Activity Title: B-1	B LTOs
29		
30	- Activity Description:	
31	1172 LTOs annuall	у
32		
33	- Activity Start Date	
34	Start Month: 1	
35	Start Year: 20	025
36		
37	- Activity End Date	
38	Indefinite: Y	es
39	End Month: N	/A
40	End Year: N	/A

B-20

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1

2 - Activity Emissions:

Theer reg Limboro	
Pollutant	Emissions Per Year (TONs)
VOC	-3.764283
SO _x	-6.226297
NO _x	-73.180537
СО	-85.808284
PM 10	-14.786680

Pollutant	Emissions Per Year (TONs)
PM 2.5	-13.234268
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-16514.5

3 4

> 5 6

7

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

incurrey Limbolo	is [inglic operations (includes	IIIII ICS					
Pollutant	ant Emissions Per Year (TONs)						
VOC	-2.424447						
SO _x	-5.427127						
NO _x	-51.753542						
СО	-79.743874						
PM 10	-13.968087						
	τ.						

a AI () partj.	
Pollutant	Emissions Per Year (TONs)
PM 2.5	-12.469553
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-15085.0

12

1172 12

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions 9

10 - Aircraft & Engine

11	Aircraft Designation:	B-1B
12	Engine Model:	F101-GE-102
13	Primary Function:	Transport - Bomber
14	Aircraft has After burn:	Yes
15	Number of Engines:	4
16		
17	- Aircraft & Engine Surrogat	e
18	Is Aircraft & Engine a Su	irrogate? No
19	Original Aircraft Name:	
20	Original Engine Name:	
21		
22	5.2.2 Aircraft & Engines B	Emission Factor(s)

22 23 24

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

An cruit & Englite Emissions Fuctors (16/100010 fuct)								
	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e
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

25

26 5.3 Flight Operations

27

28 5.3.1 Flight Operations Assumptions

29		
30	- Flight Operations	
31	Number of Aircraft:	
32	Flight Operation Cycle Type:	LTO (Landing and Takeoff)
33	Number of Annual Flight Operation Cycles	for all Aircraft:
34	Number of Annual Trim Test(s) per Aircraf	řt:
35		

36 - Default Settings Used: No

1	
2	- Flight Operations TIMs (Time In Mode)
3	Taxi [Idle] (mins): 22.66
4	Approach [Approach] (mins):6.09
5	Climb Out [Intermediate] (mins): 1.3
6	Takeoff [Military] (mins): 0 Takeoff [After Buum] (mins): 1.44
7 8	Takeoff [After Burn] (mins):1.44
8 9	Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with
10	after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2
11	flight profile was used)
12	6 · 1
13	- Trim Test
14	Idle (mins): 12
15	Approach (mins): 27
16	Intermediate (mins): 9
17	Military (mins): 9
18	AfterBurn (mins): 3
19	
20	5.3.2 Flight Operations Formula(s)
21 22	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
22	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
24	MEMPOE = (1101700) (1 C 7 1000) EX 10C 7 2000
25	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)
26	TIM: Time in Mode (min)
27	60: Conversion Factor minutes to hours
28	FC: Fuel Flow Rate (lb/hr)
29	1000: Conversion Factor pounds to 1000pounds
30	EF: Emission Factor (lb/1000lb fuel)
31	NE: Number of Engines
32	FOC: Number of Flight Operation Cycles (for all aircraft)
33	2000: Conversion Factor pounds to TONs
34 35	- Aircraft Emissions for Flight Operation Cycles per Year
35 36	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
37	ALFOC - ALMIDLE_IN + ALMIDLE_OUT + ALMAPPROACH + ALMICLIMBOUT + ALMIAKEOFF
38	AE _{FOC} : Aircraft Emissions (TONs)
39	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)
40	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
41	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
42	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
43	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
44	
45	- Aircraft Emissions per Mode for Trim per Year
46	$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$
47 48	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
40 49	TD: Test Duration (min)
50	60: Conversion Factor minutes to hours
51	FC: Fuel Flow Rate (lb/hr)
52	1000: Conversion Factor pounds to 1000pounds
53	EF: Emission Factor (lb/1000lb fuel)
54	NE: Number of Engines
55	NA: Number of Aircraft

B-22	NOVEMBER 2023									
1	NTT: Number of	f Trim Test								
2	2000: Conversion Factor pounds to TONs									
3										
4	- Aircraft Emissions for Trim per Year									
5			EPSINTERMED	DIATE + AEPS _{MILITARY} + AEP	SAFTERBURN					
6										
7	AE _{TRIM} : Aircraf	t Emissions (TONs)								
8	AEPS _{IDLE} : Airci	aft Emissions for Idl	e Power Set	ting (TONs)						
9	AEPS _{APPROACH} :	Aircraft Emissions for	or Approach	Power Setting (TONs)						
10	AEPS INTERMEDIA	TE: Aircraft Emissior	s for Interm	ediate Power Setting (TONs	5)					
11				ower Setting (TONs)						
12	AEPS _{AFTERBURN} :	Aircraft Emissions	for After Bu	rner Power Setting (TONs)						
13										
14	5.4 Auxiliary Pow	ver Unit (APU)								
15										
16	5.4.1 Auxiliary Po	ower Unit (APU) A	Assumption	18						
17										
18	- Default Settings U	sed: Yes								
19										
20	- Auxiliary Power U									
	Number of APU	Operation	Exempt	Designation	Ma					
	per Aircraft	Hours for Each LTO	Source?							
	1	2	No	GTCP 165-9						
21										
22	5.4.2 Auxiliary Po	ower Unit (APU) H	Emission F	actor(s)						
23										
24	- Auxiliary Power U	nit (APU) Emission	Factor (lb/	hr)						

- Auxiliary Power Unit (APU) Emission Factor (10/117)								
DesignationFuelVOCSOxNOxCOPM 10PM 2.5CO2e								CO ₂ e
	Flow							
GTCP 165-9	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

Manufacturer

25 26 5.4.3 Auxiliary Power Unit (APU) Formula(s) 27

28 - Auxiliary Power Unit (APU) Emissions per Year

29 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$ 30

31	APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
32	APU: Number of Auxiliary Power Units
33	OH: Operation Hours for Each LTO (hour)
34	LTO: Number of LTOs
35	EF _{POL} : Emission Factor for Pollutant (lb/hr)
36	2000: Conversion Factor pounds to tons
37	•
38	5.5 Aircraft Engine Test Cell
39	
40	5.5.1 Aircraft Engine Test Cell Assumptions
41	
42	- Engine Test Cell
43	Total Number of Aircraft Engines Tested Annually: 48
44	
45	- Default Settings Used: No
46	
47	- Annual Run-ups / Test Durations

1		s (Per Aircraft Eng			
2	Idle Duration (12		
3	Approach Dura		27		
4	Intermediate D		9		
5	Military Durati		9		
6	After Burner D	. ,	3		
7	5.5.2 Aircraft Eng	gine Test Cell Emi	ssion Fact	or(s)	
8					
9	- See Aircraft & En	gines Emission Fact	or(s)		
10					
11	5.5.3 Aircraft Eng	gine Test Cell For	mula(s)		
12					
13				& Power Setting (TONs)	
14	$TestCellPS_{POL} = (TD)$	/ 60) * (FC / 1000) *	* EF * NE *	ARU / 2000	
15			~ ~ ~		
16			Cell Emissic	ons per Pollutant & Power S	setting (TONs)
17	TD: Test Durati				
18		Factor minutes to how	urs		
19	FC: Fuel Flow I		000		
20		on Factor pounds to 1			
21		actor (lb/1000lb fuel)			
22 23		ber of Engines (For A tun-ups (Per Aircraft			
23 24		on Factor pounds to T			
24 25	2000. Conversio	on racion pounds to 1	OINS		
23 26	- Aircraft Engine To	est Call Emissions n	or Voor		
20 27				stCellPS _{INTERMEDIATE} + Test	
28	TestCellPS _{AFTERBURN}		PROACH IC.	Steem SINTERMEDIATE + Test	Celli Smilitary
29	Testeeni DAFTERBURN				
30	TestCell: Aircra	ft Engine Test Cell E	Emissions (T	ONs)	
31				ons for Idle Power Setting (TONs)
32				missions for Approach Pow	
33				1 Emissions for Intermediat	
34	TestCellPS _{MILITA}	RY: Aircraft Engine	Test Cell En	nissions for Military Power	Setting (TONs)
35	TestCellPS _{AFTER}	BURN: Aircraft Engin	e Test Cell E	Emissions for After Burner I	Power Setting (TONs)
36		-			-
37	5.6 Aerospace Gr	ound Equipment ((AGE)		
38					
39	5.6.1 Aerospace (Fround Equipmen	t (AGE) A	ssumptions	
40					
41	- Default Settings U	sed: Yes			
42					
43	- AGE Usage				
44	Number of Ann	ual LTO (Landing a	and Take-of	ff) cycles for AGE: 117	72
45			(1.6.14)		
46	- Aerospace Ground				
	Total Number of	Operation Hours	Exempt	AGE Type	Designation
	AGE	for Each LTO	Source?	Domh Lift	ML 40
	1	2.5	No	Bomb Lift Concretor Set	MJ-40
	1	2.2	No No	Generator Set Heater	A/M32A-86D H1
	1	2.4	No	Heater/Air Conditioner	B-1B Heater/Air Conditioner
	1	2.4	110		D-1D Heater/All Collulu01101

0.5

0.5

1

1

No

No

Light Cart

Start Cart

NF-2

A/M32A-95

1 2

B-24

5.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

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- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel	VOC	SOx	NOx	CO	PM 10	PM 2.5	CO ₂ e
	Flow							
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	17.1	0.258	0.121	7.659	1.409	0.152	0.148	389.3
Conditioner								
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

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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)
- 14 LTO: Number of LTOs
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons

17 18 19

20

28

30

6. Construction / Demolition

21 **6.1 General Information & Timeline Assumptions**

- 2223 Activity Location
- 24 County: Taylor
- 25 Regulatory Area(s): NOT IN A REGULATORY AREA26
- 27 Activity Title: Dyess Construction
- 29 Activity Description:
 - See Section 2.3.5

3132 - Activity Start Date

 33
 Start Month:
 1

 34
 Start Month:
 2025

 35
 35

36 - Activity End Date

- 37Indefinite:False38End Month:1239End Month:2025
- 40

41 - Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	21.232793	PM 2.5	0.630445
SO _x	0.051361	Pb	0.000000
NO _x	16.884463	NH ₃	0.030575

CO PM 10	18.931890 572.728795	5705.6
6.1 Demolition	Phase	

1	L
1 2	6.
3	
4	6.
5	
6	-]
7	
8	
9	
10	
11	-]
12	
13	
14	
15	6.
16	
17	- (
18	
19	
20	
21	-]
22	
23	- /
24	
25	- (

6.1.1 Demo	tion Phase Timeline Assump	tions
- Phase Start		

2025

- Start Month: 1 Start Quarter: 1
- Start Year:
- - 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 (ft²):
 - 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

63441

2627 - Vehicle Exhaust

- Average Hauling Truck Capacity (yd³):20 (default)
- Average Hauling Truck Round Trip Commute (mile): 20 (default)

3031 - Vehicle Exhaust Vehicle Mixture (%)

- Venicie Exil	aust vennene h	lixtui (70)					
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0
- Worker Tri Average	ps Worker Roune	d Trip Comm	ute (mile):	20 (default)			

- Worker Trips Vehicle Mixture (%)

	vorker rips vehicle (v)								
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC		
POVs	50.00	50.00	0	0	0	0	0		

37 38

39

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6.1.3 Demolition Phase Emission Factor(s)

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

Concrete/Industrial Saws Composite								
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539

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Rubber Tired Dozers Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SOx	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

1 2

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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 4

5 6

7 8 9

10

11 12

13 14

6.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} =$	(0.00042 * BA	A * BH) / 2000
---------------	---------------	----------------

- PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 0.00042: Emission Factor (lb/ft³)
- BA: Area of Building to be demolished (ft^2)
- BH: Height of Building to be demolished (ft)
- 2000: Conversion Factor pounds to tons
- 15 - Construction Exhaust Emissions per Phase 16 CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000
- 17
- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 23 2000: Conversion Factor pounds to tons 24

- Vehicle Exhaust Emissions per Phase 25

- 26 $VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$ 27 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 29 BA: Area of Building being demolish (ft²) 30 BH: Height of Building being demolish (ft) (1 / 27): Conversion Factor cubic feet to cubic yards $(1 yd^3 / 27 ft^3)$ 31 0.25: Volume reduction factor (material reduced by 75% to account for air space) 32 33 HC: Average Hauling Truck Capacity (yd³) 34 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) 35 HT: Average Hauling Truck Round Trip Commute (mile/trip) 36
- 37 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
- 38 39
- V_{POL}: Vehicle Emissions (TONs)
- 40 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

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```
1
           0.002205: Conversion Factor grams to pounds
 2
           EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
 3
           VM: Vehicle Exhaust On Road Vehicle Mixture (%)
 4
           2000: Conversion Factor pounds to tons
 5
 6
      - Worker Trips Emissions per Phase
 7
      VMT_{WT} = WD * WT * 1.25 * NE
 8
 9
           VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
10
           WD: Number of Total Work Days (days)
11
           WT: Average Worker Round Trip Commute (mile)
12
           1.25: Conversion Factor Number of Construction Equipment to Number of Works
13
           NE: Number of Construction Equipment
14
15
      V<sub>POL</sub> = (VMT<sub>WT</sub> * 0.002205 * EF<sub>POL</sub> * VM) / 2000
16
17
           V<sub>POL</sub>: Vehicle Emissions (TONs)
18
           VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
19
           0.002205: Conversion Factor grams to pounds
20
           EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
21
           VM: Worker Trips On Road Vehicle Mixture (%)
22
           2000: Conversion Factor pounds to tons
23
24
      6.2 Site Grading Phase
25
26
      6.2.1 Site Grading Phase Timeline Assumptions
27
28
      - Phase Start Date
29
           Start Month:
                            1
30
           Start Ouarter: 1
31
           Start Year:
                            2025
32
33
      - Phase Duration
34
           Number of Month: 12
35
           Number of Days:
                                 0
36
37
      6.2.2 Site Grading Phase Assumptions
38
39
      - General Site Grading Information
40
           Area of Site to be Graded (ft<sup>2</sup>):
                                                               4764407.8
41
           Amount of Material to be Hauled On-Site (vd<sup>3</sup>):
                                                               476
42
           Amount of Material to be Hauled Off-Site (yd<sup>3</sup>):
                                                               476
43
44
      - Site Grading Default Settings
45
           Default Settings Used:
                                                  Yes
46
           Average Day(s) worked per week:
                                                  5 (default)
47
48
       - Construction Exhaust (default)
                                                                                  Number Of
                                 Equipment Name
                                                                                                      Hours Per Day
                                                                                  Equipment
        Graders Composite
                                                                                       2
        Other Construction Equipment Composite
                                                                                       2
        Rollers Composite
                                                                                       1
        Rubber Tired Dozers Composite
                                                                                       3
```

8

8

8

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Scrapers	Composite						6		8
Tractors/	Loaders/Bac	ckhoes Com	posite				2		8
Avera	age Hauling age Hauling	Truck Rou	ind Trip Co		(default) default)			
- Vehicle	Exhaust Ve		re (%)	HDGV	LDDV	LDI	ידע		MC
POVs			0	0	0	0		HDDV 100.00	<u>MC</u>
	age Worker		-	e (mile):	20 (default)			
- Worker	Trips Vehi			IIDOV	IDDV				МС
DOM			DGT 50.00	HDGV	LDDV			HDDV	MC
POVs	50.	00 3	50.00	0	0	0		0	0
Emission		VOC 0.0676	SO _x 0.0014	NO _x 0.3314	CO 0.5695	PM 10 0.0147	PM 2.5 0.0147	CH ₄ 0.0061	CO ₂ 132.8
Other C	onstruction			1	<u> </u>			077	
E	F actoria	VOC	SO_x		CO	PM 10	PM 2.5	CH4	
Emission	Composite	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.6
Koners v	composite	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂
Emission	Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.12
	Tired Doze								1 0.112
		VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission		0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.4
Scrapers	s Composite	1							
	_	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission		0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.8
Tractors	s/Loaders/B	-	1	NO	CO	DM 10	DM 2 5	СП	00
Emission	Factors	VOC 0.0335	SO x 0.0007	NO _x 0.1857	CO 0.3586	PM 10 0.0058	PM 2.5 0.0058	CH4 0.0030	CO26
	Exhaust &					l.	0.0038	0.0050	00.07.
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.5
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.3
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.82
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.24
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.99
UDDU	000 101	000 004	000 000	001 540	000 040	000 020	1	000 022	01000 5

18

HDDV

MC

19 6.2.4 Site Grading Phase Formula(s)

20

21 - Fugitive Dust Emissions per Phase

000.101

002.758

22 $PM10_{FD} = (20 * ACRE * WD) / 2000$

DRAFT | ENVIRONMENTAL IMPACT STATEMENT

B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

000.004

000.003

002.293

000.620

001.540

012.221

000.042

000.023

000.038

000.020

000.032

000.054

01238.796

00389.005

 PM10_{TD}: 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_{Fol.} = (NE * WD * H * EFro.) / 2000 CEE_{Fol.}: Construction Exhaust Emissions (TONs) NE: Number of Total Work Days (days) H: Hours Work de per Day (hours) EFroc: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons - Vehicle Exhaust Emissions per Phase VMTvre: (HAomsine + HAOMSine) * (1 / HC) * HT VMTvre: Vehicle Exhaust Vehicle Miles Travel (miles) HAomsine: Amount of Material to be Hauled Off-Site (yd³) HA-Omsine: Amount of Material to be Hauled Off-Site (yd³) HA Consine: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Capacity (yd³) VFOL = (VMTvre * 0.002205 * EFroL * VM) / 2000 Vrot: Vehicle Emissions (TONs) VMTvre: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EFroq: Emissions Factor pollutant (grams/mile) VMTvr: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor pounds to tons - Worker Trips Emissions per Phase VMTwr: Worker Trips Vehicle Miles Travel (miles) 1.25: Conversion Factor Number of Construction Equipment to Number of Works NE: Number of Total Work Days (days) WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor Site Y and Y and Y and Y and Y and Y and Y and		
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day) 4 ACRE: Total acres (acres) WD: Number of Total Work Days (days) 2000: Conversion Factor pounds to tons 7 • Construction Exhaust Emissions per Phase 9 (EEFpoL = (NE * WD * H * EFpoL) / 2000 10 11 CEEpoL = (NE * WD * H * EFpoL) / 2000 11 CEEpoL : Construction Exhaust Emissions (TONs) 12 NE: Number of Total Work Days (days) 13 WD: Number of Total Work Days (days) 14 H: Hours Worked per Day (hours) 15 EFpoL: Emission Factor for Pollutant (lb/hour) 16 2000: Conversion Factor pounds to tons 17 VMTvE = (HAonsine + HAOmsine) * (1 / HC) * HT 10 VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles) 11 CAverage Hauling Truck Capacity (yd ²) 12 (J / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³) 13 HO: Conversion Factor grams to pounds 14 H: Average Hauling Truck Capacity (yd ²) 13 (J / HC): Conversion Factor grams to pounds 14 H: Average Marci grams to pounds 15 EFpoL = (VMTve * 0.002205 * EFpoL * VM) / 2000 <td></td> <td></td>		
4ACRE: Total acres (acres)5WD: Number of Total Work Days (days) 2000: Conversion Factor pounds to tons778- Construction Exhaust Emissions per Phase (CEE _{Pot} : Construction Exhaust Emissions (TONs)10111212131415161718191910101111121314151516171819191010101011121213141415151516171718191910111111121213141515161717181919111111111213141415151516161717181911111214151515 </td <td></td> <td></td>		
5WD: Number of Total Work Days (days)62000: Conversion Factor pounds to tons7-Construction Exhaust Emissions per Phase9CEE _{FoL} = (NE * WD * H * EF _{FOL}) / 200011CEE _{FoL} :: Construction Exhaust Emissions (TONs)12NE: Number of Total Work Days (days)13WD: Number of Total Work Days (days)14H: Hours Worked per Day (hours)15EF _{FOL} : Emission Factor for Pollutant (lb/hour)162000: Conversion Factor pounds to tons17VMTvE: (which Exhaust Emissions per Phase19VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)11HAonssie: Amount of Material to be Hauled Off-Site (yd ³)12HAonssie: Amount of Material to be Hauled Off-Site (yd ³)13HC: Average Hauling Truck Capacity (yd ³)14HT: Average Hauling Truck Capacity (yd ³)15(I / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)16HT: Average Hauling Truck Capacity (yd ³)17VFoL = (VMTvE * 0.002205 * EFFoL * VM) / 200018Vprot: Vehicle Exhaust On Road Vehicle Miles Travel (miles)190.002205: Conversion Factor grams to pounds20EFFoct: Emissions per Phase19VMTvE: Worker Trips Emissions per Phase10VMTwT: Worker Trips Vehicle Miles Travel (miles)200.002205: Conversion Factor pounds to tons20VMTwT: Worker Trips Vehicle Miles Travel (miles)20WD: Number of Construction Equipment to Number of Works21WD: Number of Construction Equipment<		
6 2000: Conversion Factor pounds to tons 7 - Construction Exhaust Emissions per Phase 9 CEE _{PoL} = (NE * WD * H * EFroil) / 2000 10 CEE _{PoL} : Construction Exhaust Emissions (TONs) 11 CEE _{PoL} : Construction Exhaust Emissions (TONs) 12 NE: Number of Equipment 13 WD: Number of Total Work Days (days) 14 H. Hours Worked per Day (hours) 15 EFroil : Emission Factor pounds to tons 16 . Vohicle Exhaust Emissions per Phase 17 VMTvE = (HAonsite + HAonfistite) * (1 / HC) * HT 18 . Vehicle Exhaust Emissions per Phase 19 VMTvE = (HAonsite + HAonfistite) to E Hauled Onf-Site (yd ³) 11 Hossitte: Amount of Material to be Hauled Onf-Site (yd ³) 11 HO conversion Factor cubic yards to trips (1 trip / HC yd ³) 11 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³) 12 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³) 13 HT: Average Hauling Truck Capacity (yd ³) 14 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³) 14 HT: Average Hauling Truck Round Trip Commute (miles) 0.002205: Con		
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17• Vehicle Exhaust Emissions per Phase18 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT10VMT_VE: Vehicle Exhaust Vehicle Miles Travel (miles)11HA_{OnSite}: Amount of Material to be Hauled Off-Site (yd3)12HA_OnSite: Amount of Material to be Hauled Off-Site (yd3)13HA_OnSite: Amount of Material to be Hauled Off-Site (yd3)14HC: Average Hauling Truck Capacity (yd3)15(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd3)16HT: Average Hauling Truck Round Trip Commute (mile/trip)17VPoL = (VMT_VE * 0.002205 * EFPoL * VM) / 200018VPoL: Vehicle Emissions (TONs)19VMT_VE: Vehicle Exhaust Vehicle Miles Travel (miles)200.002205: Conversion Factor grams to pounds21EFPoL: Emission Factor for Pollutant (grams/mile)23VMT_VE: Vehicle Exhaust On Road Vehicle Milex Travel (%)2000: Conversion Factor pounds to tons19VMT_WT = WD * WT * 1.25 * NE10VMT_WT: Worker Trips Vehicle Miles Travel (miles)24WD: Number of Total Work Days (days)25Conversion Factor Number of Construction Equipment to Number of Works26VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200027VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200028VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200029VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200020VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200020VPOL = (VMT_WT * 0.002205 * EFPOL * VM) / 200029VMT_WT: Wor$		
18- Vehicle Exhaust Emissions per Phase19VMTvE = (HA _{OnSite} + HA _{OffSite}) * (1 / HC) * HT20VMTvE : Vehicle Exhaust Vehicle Miles Travel (miles)21VMTvE : Vehicle Exhaust Vehicle Miles Travel (miles)22HA _{OnSite} : Amount of Material to be Hauled Off-Site (yd ³)23HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)24HC: Average Hauling Truck Capacity (yd ³)25(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)26HT: Average Hauling Truck Round Trip Commute (mile/trip)27VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200028VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200029VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200030VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200031VMTvE : Vehicle Exhaust Vehicle Miles Travel (miles)320.002205: Conversion Factor grams to pounds33EFFOC : Emission Factor for Pollutant (grams/mile)34VM: Vehicle Exhaust On Road Vehicle Mixture (%)352000: Conversion Factor pounds to tons36VMTwT = WD * WT * 1.25 * NE37VMTwT: Worker Trips Vehicle Miles Travel (miles)34WD: Number of Total Work Days (days)35WT: Average Worker Round Trip Commute (mile)361.25: Conversion Factor Number of Construction Equipment to Number of Works34NE: Number of Construction Equipment35VFOL = (VMTwT * 0.002205 * EFFOL * VM) / 200036VFOL = (VMTwT * 0.002205 * EFFOL * VM) / 200037VFOL = (VMTwT * 0.		
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		2000: Conversion Factor pounds to tons
55 6.3 Trenching/Excavating Phase		
	55	6.3 Trenching/Excavating Phase

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	NOVEMBER 2	023								
1										
2	6.3.1 Trencl	hing / E	xcavating	Phase Ti	imeline Ass	sumptions				
3	- Phase Start			,		F				
4	Start Mo		1							
5	Start Qua		1							
6	Start Qui		2025							
7			2025							
8	- Phase Durat	ion								
9	Number o		h: 12							
10	Number o		0							
10	INUILIDEL	Di Days:	0							
12	6.3.2 Trencl	hing / F	voovotino	Dhoco A	scumptions					
12	0.5.2 11010	inng / E	xcavating	, I hase A	ssumptions	•				
15 14	Conorol Tro	nohing/	Francis	Informat	ion					
14 15	- General Tre		Trenched			25200				
15			ial to be H			2.5				
10					Site (yd^3) :	2.5				
18	Amount	JI WIAWI			Bitte (yu).	2.5				
19	- Trenching D)efault S	ettings							
20	Default S				Yes					
20			orked per	week•	5 (default)					
21	Average	Day(s)	or Keu per	WUCK.	5 (default)					
23	- Construction	n Exhau	st (default)						
25	Construction	II LAHuu		, nent Nam	P		Nu	nber Of	Hour	s Per Day
			Equipi	nent i (uni	C			lipment	III	STCI Day
	Excavators C	'omposit	e					2		8
	Other Genera			en Compo	site			1		8
	Tractors/Loa				Site			1		8
24	11400015/2004	uers, Due		p 00.10				-		0
25	- Vehicle Exh	aust								
26			Truck Ca	pacity (vd ³	[']):	20 (d	lefault)			
27					Commute (m		lefault)			
28	0	0		•			,			
29	- Vehicle Exh	aust Vel	nicle Mixtu	ıre (%)						
		LDC	SV I	LDGT	HDGV	LDDV	LDI	DT H	DDV	MC
	POVs	0		0	0	0	0	1	00.00	0
30										
31	- Worker Trij									
32	Average V	Worker	Round Tri	ip Commu	te (mile):	20 (default)				
33										
34	- Worker Trij									
		LDC		LDGT	HDGV	LDDV	LDI		DDV	MC
	POVs	50.0)0	50.00	0	0	0		0	0
35										
36	6.3.3 Trencl	hing / E	xcavating	g Phase E	mission Fa	ctor(s)				
37										
38	- Construction		st Emissio	n Factors	(lb/hour) (de	efault)				
	Graders Con	mposite			I	1 1		I		
			VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e
	Emission Fac		0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
	Other Const	ruction								
			VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e
	Emission Fac		0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
	Rollers Com	posite								

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e				
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123				
Rubber Tired Dozers Composite												
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e				
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45				
Scrapers Composite	Scrapers Composite											
	VOC	SOx	NOx	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/Ba	ackhoes Co	mposite										
	VOC	SOx	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)

v emicie L		i officer and		i i accord (j		/			
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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)
- 1 ACRE: Total acres (acres)
- 2 WD: Number of Total Work Days (days)
- 2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

6 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- B CEE_{POL}: Construction Exhaust Emissions (TONs)
- 9 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 23 2000: Conversion Factor pounds to tons24

25 - Vehicle Exhaust Emissions per Phase

26 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$ 27

- 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
- 29 HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)
- 30 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
- 31 HC: Average Hauling Truck Capacity (yd³)
- 32 (1 / HC): Conversion Factor cubic yards to trips $(1 \text{ trip} / HC \text{ yd}^3)$
- HT: Average Hauling Truck Round Trip Commute (mile/trip)
- $35 \qquad V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

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1			
2	V _{POL} : Vehicle Emissions (TONs)		
3	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)		
4	0.002205: Conversion Factor grams to pounds		
5	EF _{POL} : Emission Factor for Pollutant (grams/mile)		
6	VM: Vehicle Exhaust On Road Vehicle Mixture (%)		
7	2000: Conversion Factor pounds to tons		
8			
9	- Worker Trips Emissions per Phase		
10	$VMT_{WT} = WD * WT * 1.25 * NE$		
11			
12	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
13	WD: Number of Total Work Days (days)		
14	WT: Average Worker Round Trip Commute (mile)	mbon of Warles	
15 16	1.25: Conversion Factor Number of Construction Equipment to Nu	mber of works	
16 17	NE: Number of Construction Equipment		
17 18	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
18 19	$v_{POL} = (v_{1V11}WT + 0.0022003 + ECPOL + v_{1V1}) / 2000$		
19 20	V _{POL} : Vehicle Emissions (TONs)		
20	VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)		
22	0.002205: Conversion Factor grams to pounds		
23	EF _{POL} : Emission Factor for Pollutant (grams/mile)		
24	VM: Worker Trips On Road Vehicle Mixture (%)		
25	2000: Conversion Factor pounds to tons		
26	r		
27	6.4 Building Construction Phase		
28	0		
29	6.4.1 Building Construction Phase Timeline Assumptions		
30	с		
31	- Phase Start Date		
32	Start Month: 1		
33	Start Quarter: 1		
34	Start Year: 2025		
35			
36	- Phase Duration		
37	Number of Month: 12		
38	Number of Days: 0		
39			
40	6.4.2 Building Construction Phase Assumptions		
41			
42	- General Building Construction Information		
43	Building Category: Office or Industrial		
44	Area of Building (ft^2): 1582315		
45	Height of Building (ft): 25		
46	Number of Units: N/A		
47	Duilding Construction Default Settings		
48	- Building Construction Default Settings		
49 50	Default Settings Used: Yes		
50 51	Average Day(s) worked per week: 5 (default)		
51 52	- Construction Exhaust (default)		
54	Equipment Name	Number Of	Hours Per Day
	Equipment Manie	Equipment	fiturs i er Day

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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)

16 17 18

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

Cranes Composite											
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77			
Forklifts Composite											
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449			
Generator Sets Composite											
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057			
Tractors/Loaders/Ba	ackhoes Co	mposite	•		•		•				
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872			
Welders Composite											
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650			

19 20

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

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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 7

8

9 10

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 6.4.4 Building Construction Phase Formula(s) - Construction Exhaust Emissions per Phase 	
4 - Construction Exhaust Emissions per Phase	
5 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$	
6	
7 CEE _{POL} : Construction Exhaust Emissions (TONs)	
8 NE: Number of Equipment	
9 WD: Number of Total Work Days (days)	
10 H: Hours Worked per Day (hours)	
11 EF _{POL} : Emission Factor for Pollutant (lb/hour)	
12 2000: Conversion Factor pounds to tons	
13 14 Vohiele Exhaust Emissions per Phase	
14 - Vehicle Exhaust Emissions per Phase 15 VMT _{VE} = BA * BH * (0.42 / 1000) * HT	
$15 VM1_{VE} = BA + BH + (0.4271000) + H1$ 16	
17 VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)	
18 BA: Area of Building (ft^2)	
 BA: Area of Building (ft) BH: Height of Building (ft) 	
20 (0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)	
21 HT: Average Hauling Truck Round Trip Commute (mile/trip)	
22 The first recent found frip commute (mile, dip)	
23 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$	
24	
25 V _{POL} : Vehicle Emissions (TONs)	
26 VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)	
27 0.002205: Conversion Factor grams to pounds	
28 EF _{POL} : Emission Factor for Pollutant (grams/mile)	
29 VM: Worker Trips On Road Vehicle Mixture (%)	
30 2000: Conversion Factor pounds to tons	
31	
32 - Worker Trips Emissions per Phase	
33 $VMT_{WT} = WD * WT * 1.25 * NE$	
34	
35 VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)	
36 WD: Number of Total Work Days (days)	
37 WT: Average Worker Round Trip Commute (mile)	
38 1.25: Conversion Factor Number of Construction Equipment to Num	ber of Works
39 NE: Number of Construction Equipment	
41 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$	
42	
43 V _{POL} : Vehicle Emissions (TONs)	
44 VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)	
45 0.002205: Conversion Factor grams to pounds	
 46 EF_{POL}: Emission Factor for Pollutant (grams/mile) 47 VM: Worker Trips On Road Vehicle Mixture (%) 	
 47 VM: Worker Trips On Road Vehicle Mixture (%) 48 2000: Conversion Factor pounds to tons 	
49 2000. Conversion Factor pounds to tons 49	
50 - Vender Trips Emissions per Phase	
50 VMT _{VT} = BA * BH * $(0.38 / 1000)$ * HT	
52 52 52 52 52 51 51 51 51 51 51 51 51 51 51 51 51 51	
52 VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)	
54 BA: Area of Building (ft ²)	
55 BH: Height of Building (ft)	

			o trips (0.38 trip		
HT: Aver	age Hauling T	ruck Round T	rip Commute (1	nile/trip)	
u ane	* 0.000007				
$V_{POL} = (VMT_{V})$)/2000		
	nicle Emission Vender Trips V		Traval (milas)		
	Conversion F				
	nission Factor				
	ker Trips On H				
	version Facto				
20001 001		i poundo to to			
6.5 Architec	tural Coatin	gs Phase			
6.5.1 Archit	ectural Coat	ings Phase 'l	Timeline Assu	imptions	
- Phase Start]	Date				
Start Mo					
Start Qua	rter: 1				
Start Yea	r: 2025				
- Phase Durat					
Number o					
Number o	of Days: 0				
6.5.2 Archit	ectural Coat	ings Phase A	Assumptions		
- General Arc	hitactural Ca	atings Inform	ation		
Building		Non-Resid			
	are Footage (
Number o		N/A			
- Architectura	l Coatings De	efault Settings	5		
Default S	ettings Used:	-	Yes		
Average I	Day(s) worked	l per week:	5 (default)		
- Worker Trip	16				
	,s Worker Roun	d Trip Comm	nute (mile):	20 (default)	
i i uge	. street room			_= (actuall)	
- Worker Trip					_
	LDGV 50.00	LDGT	HDGV	LDDV 0	LDDT 0
POVs		50.00	0		

41 42

43

- Worker Trips Emission Factors (grams/mile)

	1			-)					
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

HDDV

0

MC

NOVEMBER 2023 6.5.4 Architectural Coatings Phase Formula(s) 1 2 3 4 - Worker Trips Emissions per Phase 5 $VMT_{WT} = (1 * WT * PA) / 800$ 6 7 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 8 1: Conversion Factor man days to trips (1 trip / 1 man * day) 9 WT: Average Worker Round Trip Commute (mile) 10 PA: Paint Area (ft²) 800: Conversion Factor square feet to man days (1 ft² / 1 man * day) 11 12 13 V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 14 15 V_{POL}: Vehicle Emissions (TONs) 16 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds 17 18 EF_{POL}: Emission Factor for Pollutant (grams/mile) 19 VM: Worker Trips On Road Vehicle Mixture (%) 20 2000: Conversion Factor pounds to tons 21 22 - Off-Gassing Emissions per Phase 23 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$ 24 25 VOC_{AC}: Architectural Coating VOC Emissions (TONs) 26 BA: Area of Building (ft²) 2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area) 27 28 0.0116: Emission Factor (lb/ft²) 29 2000: Conversion Factor pounds to tons 30 31 6.6 Paving Phase 32 33 6.6.1 Paving Phase Timeline Assumptions 34 35 - Phase Start Date 36 Start Month: 1 37 Start Quarter: 1 2025 38 Start Year: 39 40 - Phase Duration 41 Number of Month: 12 42 Number of Days: 0 43 44 6.6.2 Paving Phase Assumptions 45 46 - General Paving Information 47 Paving Area (ft²): 2651744 48 49 - Paving Default Settings 50 **Default Settings Used:** Yes 51 Average Day(s) worked per week: 5 (default)

52

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	Equipment Name							Hours Per Day		
Pavers Co	Pavers Composite						i ipment 1		8	
	quipment Co	omposite					2		8	
Rollers C		•					2		6	
Vehicle H										
	ge Hauling Exhaust Vel		-	ommute (m	ile): 20 (default)				
venicie i	LDC		DGT	HDGV	LDDV	LDI	I TC	HDDV	MC	
POVs	0		0	0	0	0		100.00	0	
	Trips ge Worker Trips Vehic		-	te (mile):	20 (default)				
WOIKCI			DGT	HDGV	LDDV	LDI	T TC	HDDV	MC	
POVs	50.0		50.00	0	0	0		0	0	
	Composite	st Emission	`	lb/hour) (de	, , , , , , , , , , , , , , , , , , ,	PM 10	DM 2 5	СП	COm	
Emission	Factors	0.0676	SO x 0.0014	NO _x 0.3314	CO 0.5695	PM 10 0.0147	PM 2.5 0.0147	CH4 0.0061	CO2e 132.89	
	nstruction				0.3093	0.0147	0.0147	0.0001	152.89	
other Ct		VOC	SO _x	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission	Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60	
	Composite									
		VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission	Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123	
Rubber 7	Fired Doze	s Composi			-					
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e	
Emission		0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45	
Scrapers	Composite	1		NO	660	D) (10	D) (A 7		60	
D ania di c	Easta	VOC	SO_x	NO _x	CO	PM 10	PM 2.5	CH4	CO2e	
Emission		0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81	
Tactors	/Loaders/Ba	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission	Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872	
2111351011	- 401015	0.00000	0.0007	0.1007	0.0000	0.0000	0.0000	0.0050	00.072	
Vehicle I	Exhaust & V	<u>Worke</u> r Tri	ps Emissio	n Factors (grams/mile)				
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e	
LDGV	000.197	000.002	000.094	003.149	000.003	000.003		000.024	00306.50	
LDGT	000.208	000.003	000.168	003.545	000.005	000.004		000.026	00398.33	
HDGV	000.890	000.006	000.817	013.497	000.022	000.020		000.051	00913.82	
LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311.24	
LDDT	000.064	000.001	000.119	002.357	000.003	000.003		000.009	00361.99	
HDDV	000.101	000.004	002.293	001.540	000.042	000.038		000.032	01238.79	
MC	002.758	000.003	000.620	012.221	000.023	000.020		000.054	00389.00	

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

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1	CEE _{POL} : Construction Exhaust Emissions (TONs)
2	NE: Number of Equipment
3	WD: Number of Total Work Days (days)
4	H: Hours Worked per Day (hours)
5	EF _{POL} : Emission Factor for Pollutant (lb/hour)
6	2000: Conversion Factor pounds to tons
7	2000. Conversion ractor pounds to tons
8	- Vehicle Exhaust Emissions per Phase
8 9	$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$
10	$V_{111}V_{E} = 1 R + 0.23 + (1 / 27) + (1 / 11C) + 111$
10	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
12	PA: Paving Area (ft^2)
13	0.25: Thickness of Paving Area (ft) (1/27). Comparing Fractional biometry $(1-13/27, 63)$
14	$(1 / 27)$: Conversion Factor cubic feet to cubic yards $(1 \text{ yd}^3 / 27 \text{ ft}^3)$
15	HC: Average Hauling Truck Capacity (yd ³)
16	$(1 / \text{HC})$: Conversion Factor cubic yards to trips $(1 \text{ trip} / \text{HC} \text{ yd}^3)$
17	HT: Average Hauling Truck Round Trip Commute (mile/trip)
18	
19	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
20	
21	V _{POL} : Vehicle Emissions (TONs)
22	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
23	0.002205: Conversion Factor grams to pounds
24	EF _{POL} : Emission Factor for Pollutant (grams/mile)
25	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
26	2000: Conversion Factor pounds to tons
27	
28	- Worker Trips Emissions per Phase
28 29	- Worker Trips Emissions per Phase VMT _{WT} = WD * WT * 1.25 * NE
29	
29 30	VMT _{WT} = WD * WT * 1.25 * NE VMT _{WT} : Worker Trips Vehicle Miles Travel (miles) WD: Number of Total Work Days (days)
29 30 31	VMT _{WT} = WD * WT * 1.25 * NE VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
29 30 31 32	VMT _{WT} = WD * WT * 1.25 * NE VMT _{WT} : Worker Trips Vehicle Miles Travel (miles) WD: Number of Total Work Days (days)
29 30 31 32 33	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)
29 30 31 32 33 34	 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
29 30 31 32 33 34 35	 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
29 30 31 32 33 34 35 36	 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
29 30 31 32 33 34 35 36 37	 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
29 30 31 32 33 34 35 36 37 38	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)
29 30 31 32 33 34 35 36 37 38 39	 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 VPOL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL}: Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
29 30 31 32 33 34 35 36 37 38 39 40 41	 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 VPOL = (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
29 30 31 32 33 34 35 36 37 38 39 40 41 42	 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 VPOL = (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)
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	 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 VPOL = (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 (%)
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44	 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 VPOL = (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)
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45	 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 VPOL = (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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	 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 VPOL = (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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	 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 VPOL = (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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	$VMT_{WT} = WD * WT * 1.25 * NE$ $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)$ $WD: Number of Total Work Days (days)$ $WT: Average Worker Round Trip Commute (mile)$ $1.25: Conversion Factor Number of Construction Equipment to Number of Works$ $NE: Number of Construction Equipment$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $- Off-Gassing Emissions per Phase$ $VOC_P = (2.62 * PA) / 43560$ $VOC_P: Paving VOC Emissions (TONs)$
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	$VMT_{WT} = WD * WT * 1.25 * NE$ $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)$ $WD: Number of Total Work Days (days)$ $WT: Average Worker Round Trip Commute (mile)$ $1.25: Conversion Factor Number of Construction Equipment to Number of Works$ $NE: Number of Construction Equipment$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $- Off-Gassing Emissions per Phase$ $VOC_{P} = (2.62 * PA) / 43560$ $VOC_{P}: Paving VOC Emissions (TONs)$ $2.62: Emission Factor (lb/acre)$
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51	$VMT_{WT} = WD * WT * 1.25 * NE$ $VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)$ $WD: Number of Total Work Days (days)$ $WT: Average Worker Round Trip Commute (mile)$ $1.25: Conversion Factor Number of Construction Equipment to Number of Works$ $NE: Number of Construction Equipment$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $- Off-Gassing Emissions per Phase$ $VOC_P = (2.62 * PA) / 43560$ $VOC_P: Paving VOC Emissions (TONs)$ $2.62: Emission Factor (lb/acre)$ $PA: Paving Area (ft2)$
$\begin{array}{c} 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ \end{array}$	$VMT_{WT} = WD * WT * 1.25 * NE$ $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)$ $WD: Number of Total Work Days (days)$ $WT: Average Worker Round Trip Commute (mile)$ $1.25: Conversion Factor Number of Construction Equipment to Number of Works$ $NE: Number of Construction Equipment$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $- Off-Gassing Emissions per Phase$ $VOC_{P} = (2.62 * PA) / 43560$ $VOC_{P}: Paving VOC Emissions (TONs)$ $2.62: Emission Factor (lb/acre)$
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51	$VMT_{WT} = WD * WT * 1.25 * NE$ $VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)$ $WD: Number of Total Work Days (days)$ $WT: Average Worker Round Trip Commute (mile)$ $1.25: Conversion Factor Number of Construction Equipment to Number of Works$ $NE: Number of Construction Equipment$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $- Off-Gassing Emissions per Phase$ $VOC_P = (2.62 * PA) / 43560$ $VOC_P: Paving VOC Emissions (TONs)$ $2.62: Emission Factor (lb/acre)$ $PA: Paving Area (ft2)$

 Total Emissions (TONs)

 0.438996

 0.000000

 0.006508

 3554.8

1 7. Construction / Demolition

7.1 General Inf	ormation & Timeline Assur	I	
- Activity Locatio County: Ta Regulatory A	aylor	TORY ARE.	A
- Activity Title:	Dyess WGF		
- Activity Descrip See Section 2.			
- Activity Start Da Start Month: Start Month:	1		
- Activity End Da Indefinite: End Month: End Month:	te False 12 2025		
- Activity Emissio	ons:		
Pollutant	Total Emissions (TONs)		Pollutant
VOC	2.950959		PM 2.5
SO _x	0.035705		Pb
SO _x NO _x	0.035705 11.062384		NH ₃
SO _x NO _x CO	0.035705 11.062384 13.195307	_	
SO _x NO _x	0.035705 11.062384		NH ₃
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading - Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of Date	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 r: 1 2025 Jonth: 12 ays: 0	tions	NH ₃
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading Start Month: Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of D	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 r: 1 2025 Ionth: 12	tions	NH ₃
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading Phase Start Date Start Month: Start Quarter Start Year: Phase Duration Number of M Number of Date 7.1.2 Site Grading - General Site Grading	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 1 2025 Ionth: 12 ays: 0 ing Phase Assumptions ading Information	tions	NH ₃
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading - Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of Date 7.1.2 Site Grading - General Site Grading - General Site Grading	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 r: 1 2025 Ionth: 12 ays: 0 ing Phase Assumptions ading Information to be Graded (ft ²):	2178	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading Phase Start Date Start Month: Start Quarter Start Year: Phase Duration Number of M Number of Date 7.1.2 Site Grading General Site Grading General Site Grading Area of Site to Amount of M	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 r: 1 2025 Jonth: 12 ays: 0 ing Phase Assumptions ading Information to be Graded (ft ²): Jaterial to be Hauled On-Site (5)	2178 yd³): 217	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of Date 7.1.2 Site Grading - General Site Grading - General Site Grading - May and Site Grading	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 r: 1 2025 Ionth: 12 ays: 0 ing Phase Assumptions ading Information to be Graded (ft ²):	2178 yd³): 217	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading - Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of Date 7.1.2 Site Grading - General Site Grading - General Site Grading - Manual Site Grading - Mathematical Site Grading - Mathemathematical Site Grading	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 1 2025 Ionth: 12 2025 Ionth: 12 2025 Ionth: 12 ays: 0 ing Phase Assumptions ading Information to be Graded (ft ²): Iaterial to be Hauled On-Site (Jaterial to be Hauled Off-Site (Jateria) to be Hauled Off-Site (Jateria) to Hauled	2178 yd³): 217	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading - Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of D 7.1.2 Site Grading - General Site Grading - General Site Grading De	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 1 2025 Jonth: 12 2025 Jonth: 12 Jonth: 12 Jo	2178 yd³): 217	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading 7.1.1 Site Grading - Phase Start Date Start Month: Start Quarter Start Year: - Phase Duration Number of M Number of D 7.1.2 Site Grading - General Site Grading Der Amount of M Amount of M Site Grading Der Default Setting	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 1 2025 Ionth: 12 2025 Ionth: 12 2025 Ionth: 12 2025 Ionth: 12 ays: 0 ing Phase Assumptions ading Information to be Graded (ft ²): Iaterial to be Hauled On-Site (filterial to be Hauled Off-Site (filterial to be Hauled Site))	2178 yd³): 217 yd³): 217	NH ₃ CO ₂ e
SOx NOx CO PM 10 7.1 Site Grading 7.1.1 Site Grading Phase Start Date Start Month: Start Quarter Start Year: Phase Duration Number of M Number of D 7.1.2 Site Grading General Site Grading Der Area of Site time Amount of M Site Grading Der Default Setting	0.035705 11.062384 13.195307 262.981963 g Phase ing Phase Timeline Assump e 1 1 2025 Jonth: 12 2025 Jonth: 12 Jonth: 12 Jo	2178 yd³): 217 yd³): 217	NH ₃ CO ₂ e

- 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 (yd³): Average Hauling Truck Round Trip Commute (mile):

20 (default) 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

13 14

16

14 **7.1.3 Site Grading Phase Emission Factor(s)**15

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

Graders Composi

Graders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozen	rs Composit	te						
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SOx	NOx	СО	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/Ba	Tractors/Loaders/Backhoes Composite							
	VOC	SOx	NOx	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

17 18

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

19

20 **7.1.4 Site Grading Phase Formula(s)**

B-40

1

2 3

4

5

6 7

8 9

10

1	- Fugitive Dust Emissions per Phase
2	$PM10_{FD} = (20 * ACRE * WD) / 2000$
3	
4	PM10 _{FD} : Fugitive Dust PM 10 Emissions (TONs)
5	20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
6	ACRE: Total acres (acres)
7	WD: Number of Total Work Days (days)
8	2000: Conversion Factor pounds to tons
9	
10	- Construction Exhaust Emissions per Phase
11	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
12	
13	CEE _{POL} : Construction Exhaust Emissions (TONs)
14	NE: Number of Equipment
15	WD: Number of Total Work Days (days)
16	H: Hours Worked per Day (hours)
17	EF _{POL} : Emission Factor for Pollutant (lb/hour)
18	2000: Conversion Factor pounds to tons
19	- Vehicle Exhaust Emissions per Phase
20	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
21	
22	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
23	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
24	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
25	HC: Average Hauling Truck Capacity (yd ³)
26	$(1 / HC)$: Conversion Factor cubic yards to trips $(1 \text{ trip} / HC \text{ yd}^3)$
27	HT: Average Hauling Truck Round Trip Commute (mile/trip)
28	
29	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
30	
31	V _{POL} : Vehicle Emissions (TONs)
32	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
33	0.002205: Conversion Factor grams to pounds
34	EF _{POL} : Emission Factor for Pollutant (grams/mile)
35	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
36	2000: Conversion Factor pounds to tons
37	
38	- Worker Trips Emissions per Phase
39	$VMT_{WT} = WD * WT * 1.25 * NE$
40	
41	VMT _{wT} : Worker Trips Vehicle Miles Travel (miles)
42	WD: Number of Total Work Days (days)
43	WT: Average Worker Round Trip Commute (mile)
44	1.25: Conversion Factor Number of Construction Equipment to Number of Works
45	NE: Number of Construction Equipment
46	
47	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
48	
49	V _{POL} : Vehicle Emissions (TONs)
50	VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)
51	0.002205: Conversion Factor grams to pounds
52	EF _{POL} : Emission Factor for Pollutant (grams/mile)
53	VM: Worker Trips On Road Vehicle Mixture (%)
54	2000: Conversion Factor pounds to tons
55	7.2 Trenching/Excavating Phase

- Phase Start Start Mo Start Qu Start Ye - Phase Dura	Date							
Start Qu Start Ye	Date							
Start Ye	onth: 1							
Phase Dura	ar: 2025							
	tion							
Number	of Month:	12						
Number	of Days:	0						
7.2.2 Trend	ching / Exca	vating Phase	e Assumptions	5				
General Tr	enching/Exca	vating Inform	nation					
		nched/Excava		21300				
			On-Site (yd ³):	2.1				
Amount	of Material t	o be Hauled (Off-Site (yd ³):	2.1				
Trenching	Default Settir	igs						
	Settings Used		Yes					
Average	Day(s) work	ed per week:	5 (default)					
Constructio	on Exhaust (d	efault)						
Construction		Equipment Na	ame		Nur	nber Of	Hours	s Per Day
					Equ	lipment		
Excavators			•.			2		8
	al Industrial E	Equipmen Con	nposite			1		<u>8</u> 8
11401013/120	dder 5/ Daekilot	<u>s composite</u>				1		0
· Vehicle Exl	naust							
		ck Capacity (lefault)			
Average	Hauling Tru	ck Round Tri	ip Commute (m	nile): 20 (d	lefault)			
· Vehicle Exl	naust Vehicle	Mixture (%)	1					
DOLL	LDGV	LDGT	HDGV	LDDV				MC
POVs	0	0	0	0	0	1	00.00	0
Worker Tr	ins							
		nd Trip Com	mute (mile):	20 (default))			
3-		-	· · ·					
			IDOV	IDDV	IDI			MC
· Worker Tr	LDGV	LDGT 50.00	HDGV 0	LDDV	LDI 0		IDDV	MC
	50.00	30.00	0	0	0		0	Δ
- Worker Tr POVs	50.00							0
POVs		vating Phase	e Emission Fa	ctor(s)				0
		vating Phase	e Emission Fa	ctor(s)				0
POVs 7.2.3 Trend - Constructio	ching / Exca on Exhaust E	U	e Emission Fac					0
POVs 7.2.3 Trend	ching / Exca on Exhaust E omposite	mission Facto	ors (lb/hour) (de	efault)				
POVs 7.2.3 Trend - Construction Graders Co	ching / Exca on Exhaust E omposite V	mission Facto	ors (lb/hour) (de D _x NO _x	efault) CO	PM 10	PM 2.5	CH4	CO ₂
POVs 7.2.3 Trend Construction Graders Construction Emission Fa	ching / Exca on Exhaust E omposite V actors 0.	mission Factor OC SO 0676 0.00	ors (lb/hour) (do)x NOx 114 0.3314	efault)	PM 10 0.0147	PM 2.5 0.0147	CH ₄ 0.0061	CO ₂
POVs 7.2.3 Trend Construction Graders Construction Emission Fa	ching / Exca on Exhaust E omposite write v of the sectors of the sectors of the sector	mission Facto	ors (lb/hour) (do 0x NOx 114 0.3314 posite	efault) CO				0 CO24 132.8 CO20

CO₂e 132.89

CO₂e 122.60

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Rubber Tired Dozers Composite								
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite	Scrapers Composite							
	VOC SOx NOx CO PM 10 PM 2.5 CH4 CO2e							CO ₂ e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Ba	Tractors/Loaders/Backhoes Composite							
VOC SOx NOx CO PM 10 PM 2.5 CH4 CO2e							CO ₂ e	
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

1 2

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

						/			
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

- 6 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 8 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 1 H: Hours Worked per Day (hours)
- EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 23 2000: Conversion Factor pounds to tons

5 - Vehicle Exhaust Emissions per Phase

		-	
26	$VMT_{VE} = (HA_{OnSite})$	+ HA _{OffSite}) * (1	/ HC) * HT

- 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
- 29 HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)
- $HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd³)
- 31 HC: Average Hauling Truck Capacity (yd³)
- 32 (1 / HC): Conversion Factor cubic yards to trips $(1 \text{ trip} / \text{HC yd}^3)$
- 33 HT: Average Hauling Truck Round Trip Commute (mile/trip)
- 34 35 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
- 3637 V_{POL}: Vehicle Emissions (TONs)

4	NOVEMBER 2023		
	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		
	Washen Twing Fusiasions non Dhoos		
	- Worker Trips Emissions per Phase VMT _{WT} = WD * WT * 1.25 * NE		
	$\mathbf{W}_{\mathrm{M}1}\mathbf{W}_{\mathrm{T}} = \mathbf{W}\mathbf{D} + \mathbf{W}1 + 1.25 + \mathbf{N}\mathbf{E}$		
	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 Nu	mber of Works	
	NE: Number of Construction Equipment		
	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
	V Vahiolo Emissione (TONe)		
	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		
	r		
	7.3 Building Construction Phase		
	U		
	7.3.1 Building Construction Phase Timeline Assumptions		
	- Phase Start Date		
	Start Month: 1		
	Start Quarter: 1 Start Voor 2025		
	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 Sottings		
	- Building Construction Default Settings Default Settings Used: Yes		
	Average Day(s) worked per week: 5 (default)		
	Trenge Day (5) worked per week. 5 (derault)		
	- Construction Exhaust (default)		
	Equipment Name	Number Of	
		Equipment	
	Cranes Composite	1	⊢
	Forklifts Composite	2	Ì

Hours Per Day

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 (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

15 16

1 2

3

4 5

6 7

8

9 10

11

12

13 14

7.3.3 Building Construction Phase Emission Factor(s)

17 18

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

Cranes Composite VOC **SO**_x **NO**_x СО PM 2.5 CH₄ **PM 10** CO₂e **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 CH₄ CO₂e **Emission Factors** 0.0236 0.0006 0.0859 0.2147 0.0025 0.0025 0.0021 54.449 **Generator Sets Composite SO**_x СО **PM 10** PM 2.5 VOC **NO**_x CH₄ CO₂e 0.2329 **Emission Factors** 0.0287 0.0006 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 CH₄ CO₂e **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 CH₄ CO₂e **Emission Factors** 0.0214 0.0003 0.1373 0.1745 0.0051 0.0051 0.0019 25.650

19 20

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

21 7.3.4 Building Construction Phase Formula(s)

22

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1	- Construction Exhaust Emissions per Phase
2	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
3	
4	CEE _{POL} : Construction Exhaust Emissions (TONs)
5	NE: Number of Equipment
6	WD: Number of Total Work Days (days)
7	H: Hours Worked per Day (hours)
8	EF _{POL} : Emission Factor for Pollutant (lb/hour)
9	2000: Conversion Factor pounds to tons
10	
11	- Vehicle Exhaust Emissions per Phase
12	$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$
13	
14	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
15	BA: Area of Building (ft^2)
16	BH: Height of Building (ft)
17	$(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$
18	HT: Average Hauling Truck Round Trip Commute (mile/trip)
19	
20	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
21	$\mathbf{V} = \mathbf{V} 1^{\dagger} 1 1 \mathbf{F} 1^{\dagger} 1 2 \mathbf{T} \mathbf{O} \mathbf{V}$
22	V _{POL} : Vehicle Emissions (TONs)
23 24	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds
24 25	EF _{POL} : Emission Factor for Pollutant (grams/mile)
25 26	VM: Worker Trips On Road Vehicle Mixture (%)
20 27	2000: Conversion Factor pounds to tons
28	2000. Conversion ractor pounds to tons
29	- Worker Trips Emissions per Phase
30	$VMT_{WT} = WD * WT * 1.25 * NE$
31	
32	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
33	WD: Number of Total Work Days (days)
34	WT: Average Worker Round Trip Commute (mile)
35	1.25: Conversion Factor Number of Construction Equipment to Number of Works
36	NE: Number of Construction Equipment
37	
38	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
39	
40	V _{POL} : Vehicle Emissions (TONs)
41	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
42	0.002205: Conversion Factor grams to pounds
43	EF _{POL} : Emission Factor for Pollutant (grams/mile)
44	VM: Worker Trips On Road Vehicle Mixture (%)
45	2000: Conversion Factor pounds to tons
46	Vandau Trina Ensistiana nau Dhasa
47 48	- Vender Trips Emissions per Phase
48 49	$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
49 50	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
50 51	BA: Area of Building (ft^2)
52	BA: Area of Building (ft) BH: Height of Building (ft)
52 53	(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)
55 54	HT: Average Hauling Truck Round Trip Commute (mile/trip)
55	····· ································

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$V_{POL} = (V)$	$MT_{VT} * 0.00$	02205 * EF _P	ol * VM) / 1	2000					
Vnor	Vehicle En	vissions (TC	N _g)						
	vender 7			vel (miles)					
	205: Conver								
	: Emission								
	Worker Trip								
2000:	Conversion	Factor pou	nds to tons						
			_						
7.4 Arch	itectural (Coatings P	hase						
7/1 Ar	chitectural	Contings	Dhoco Tin	nolino Acc	umptions				
/.4.1 AI	cintectural	Coatings	rnase m	lienne Ass	umpuons				
- Phase St	art Date								
		1							
		1							
		2025							
- Phase D	uration								
Numl	per of Mont	h: 12							
Numb	per of Days:	0							
7.4.2 Ar	chitectural	Coatings	Phase Ass	sumptions					
	Architectu								
	ing Categor		on-Residen	tial					
	Square Foo		81620						
Numi	per of Units	: N	/A						
- Architec	tural Coati	nas Default	Settings						
	It Settings		-	Yes					
	age Day(s) v			6 (default)					
		· · · · · · · · · · · · · · · · · · ·		()					
- Worker									
Avera	age Worker	Round Tri	p Commut	e (mile):	20 (default	.)			
- Worker	Trips Vehic	le Mivture	(%)						
- WOIKCI	LDC		DGT	HDGV	LDDV	LDI	DT	HDDV	MC
POVs	50.0	00 5	50.00	0	0	0		0	0
7 4 2 4	chitectural	Castings	Dhaga E-	ianian Eac	4 am(a)				
/. 4 .3 Alt		Coatings	I Hase Lin	11551011 I'ac	101(5)				
- Worker	Trips Emis	sion Factor	s (grams/m	nile)					
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
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	1	000.032	01238.796

42

MC

43 **7.4.4** Architectural Coatings Phase Formula(s)

000.003

000.620

012.221

000.023

000.020

002.758

44

000.054

00389.005

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l	- Worker Trips Emissions per Phase	
2	$VMT_{WT} = (1 * WT * PA) / 800$	
3		
	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 ($1 \text{ ft}^2 / 1 \text{ man } * \text{ da}$	T)
	800. Conversion raciol square reet to man days (1 ft / 1 man · da	.y)
	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$	
	$v_{POL} = (v_{IVII} w_T + 0.002203 + EFPOL + v_{IVI}) / 2000$	
	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 Cossing Emissions nor Phase	
	- Off-Gassing Emissions per Phase	
	$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$	
	VOC	
	VOC _{AC} : Architectural Coating VOC Emissions (TONs) BA: Area of Building (ft ²)	
		(total area)
	2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area 0.0116; Emission Factor (lb/tf ²)	/ iotal area)
	0.0116: Emission Factor (lb/ft ²) 2000: Conversion Factor pounds to tops	
	2000: Conversion Factor pounds to tons	
	7.5 Desing Diago	
	7.5 Paving Phase	
	7.5.1 Paving Phase Timeline Assumptions	
	1.5.1 1 aving 1 hast 1 menne Assumptions	
	- Phase Start Date	
	Start Month: 1	
	Start Quarter: 1	
	Start Year: 2025	
	Start 1 (a), 2023	
	- Phase Duration	
	Number of Month: 12	
	Number of Days: 0	
	Tumbel of Days.	
	7.5.2 Paving Phase Assumptions	
	1.5.4 I aving I hast Assumptions	
	- General Paving Information	
	Paving Area (ft ²): 410911	
	1 aving Aita (11). 410711	
	- Paving Default Settings	
	Default Settings Used: Yes	
	Average Day(s) worked per week: 5 (default)	
	Average Day(s) worken per week. J (ucranit)	
	- Construction Exhaust (default)	
	Equipment Name	Number Of
	Equipment runte	Equipment
	Pavers Composite	1
	Paving Equipment Composite	2
	- at any Equipment Composite	<u> </u>

Hours Per Day

8

6

D 40

Rollers Composite							2		6	
Vehicle I Avera				ommute (m	ile): 20 (default)				
	LDO	GV I	DGT	HDGV	LDDV	LDI	DT I	HDDV	MC	
POVs	0		0	0	0	0	-	100.00	0	
	Trips ige Worker Trips Vehio		-	e (mile):	20 (default)				
	LDC		DGT	HDGV	LDDV	LDI	DT I	HDDV	MC	
POVs	50.0	00	50.00	0	0	0		0	0	
	Composite	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission		0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89	
Other Co	onstruction		-	1	T	T	T	T		
	_	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e	
Emission		0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60	
								1	122.00	
Rubber '	l irea Dozei		1	NO	CO	DM 10	DM 2 5	CU		
		VOC	SOx	NO _x	CO	PM 10 0.0418	PM 2.5	CH4	CO ₂ e	
Emission	Factors	VOC 0.1671	1	NO _x 1.0824	CO 0.6620	PM 10 0.0418	PM 2.5 0.0418	CH4 0.0150		
Emission		VOC 0.1671	SO x 0.0024	1.0824	0.6620			0.0150	CO2e 239.45	
Emission	Factors Composite	VOC 0.1671	SOx			0.0418	0.0418		CO ₂ e	
Emission Scrapers Emission	Factors Composite	VOC 0.1671 VOC 0.1495	SO _x 0.0024 SO _x 0.0026	1.0824 NO _x	0.6620 CO	0.0418 PM 10	0.0418 PM 2.5	0.0150 CH4	CO2e 239.45 CO2e	
Emission Scrapers Emission Tractors	Factors Composite Factors /Loaders/B	VOC 0.1671 VOC 0.1495 ackhoes Cc VOC	SOx 0.0024 SOx 0.0026 omposite SOx	1.0824 NOx 0.8387 NOx	0.6620 CO 0.7186 CO	0.0418 PM 10 0.0334 PM 10	0.0418 PM 2.5 0.0334 PM 2.5	0.0150 CH4 0.0134 CH4	CO2e 239.45 CO2e 262.81 CO2e	
Emission Scrapers Emission	Factors Composite Factors /Loaders/B	VOC 0.1671 VOC 0.1495 ackhoes Co	SOx 0.0024 SOx 0.0026 omposite	1.0824 NO x 0.8387	0.6620 CO 0.7186	0.0418 PM 10 0.0334	0.0418 PM 2.5 0.0334	0.0150 CH4 0.0134	CO2e 239.45 CO2e 262.81	
Emission Scrapers Emission Tractors Emission	Factors Composite Factors /Loaders/B	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007	NOx 0.8387 NOx 0.1857	0.6620 CO 0.7186 CO 0.3586	0.0418 PM 10 0.0334 PM 10 0.0058	0.0418 PM 2.5 0.0334 PM 2.5	0.0150 CH4 0.0134 CH4	CO2e 239.45 CO2e 262.81 CO2e	
Emission Scrapers Emission Tractors Emission	Factors Composite Factors /Loaders/B Factors	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007	NOx 0.8387 NOx 0.1857	0.6620 CO 0.7186 CO 0.3586	0.0418 PM 10 0.0334 PM 10 0.0058	0.0418 PM 2.5 0.0334 PM 2.5	0.0150 CH4 0.0134 CH4	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e	
Emission Scrapers Emission Tractors Emission Vehicle I LDGV	Factors Composite Factors /Loaders/B Factors Exhaust & V VOC 000.197	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335 Worker Tr SO _x 000.002	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007 ips Emissio NOx 000.094	1.0824 NO x 0.8387 NO x 0.1857 n Factors (g CO 003.149	0.6620 CO 0.7186 CO 0.3586 grams/mile PM 10 000.003	0.0418 PM 10 0.0334 PM 10 0.0058 PM 2.5 000.003	0.0418 PM 2.5 0.0334 PM 2.5 0.0058	0.0150 CH4 0.0134 CH4 0.0030 NH ₃ 000.024	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e 00306.502	
Emission Scrapers Emission Tractors Emission Vehicle I LDGV LDGV	Factors Composite Factors /Loaders/B Factors Exhaust & V VOC 000.197 000.208	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335 Worker Tr SO _x 000.002 000.003	SOx 0.0024 SOx 0.0026 omposite SOx 0.0007 ps Emissio NOx 000.094 000.168	NOx 0.8387 NOx 0.1857 n Factors (g CO 003.149 003.545	0.6620 CO 0.7186 CO 0.3586 grams/mile PM 10 000.003 000.005	0.0418 PM 10 0.0334 PM 10 0.0058 PM 2.5 000.003 000.004	0.0418 PM 2.5 0.0334 PM 2.5 0.0058	0.0150 CH4 0.0134 CH4 0.0030 NH ₃ 000.024 000.026	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e 00306.502 00398.336	
Emission Scrapers Emission Tractors Emission Vehicle I LDGV LDGV LDGT HDGV	Factors Composite Factors /Loaders/B Factors Exhaust & VOC 000.197 000.208 000.890	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335 Worker Tr SO _x 000.002 000.003 000.003	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007 ips Emissio NOx 000.094 000.168 000.817	NOx 0.8387 NOx 0.1857 n Factors (g 003.149 003.545 013.497	0.6620 CO 0.7186 CO 0.3586 grams/mile PM 10 000.003 000.005 000.022	0.0418 PM 10 0.0334 PM 10 0.0058 PM 2.5 000.003 000.004 000.020	0.0418 PM 2.5 0.0334 PM 2.5 0.0058	0.0150 CH4 0.0134 CH4 0.0030 NH3 000.024 000.026 000.051	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e 00306.502 00398.336 00913.820	
Emission Scrapers Emission Tractors Emission Vehicle I LDGV LDGV LDGV LDDV	Factors Composite Factors /Loaders/B Factors Exhaust & VOC 000.197 000.208 000.890 000.059	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335 Worker Tr SO _x 000.002 000.003 000.006 000.001	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007 ips Emissio NOx 000.094 000.168 000.817 000.080	NOx 0.8387 NOx 0.1857 n Factors (g CO 003.149 003.545 013.497 003.473	0.6620 CO 0.7186 CO 0.3586 grams/mile PM 10 000.003 000.005 000.022 000.003	0.0418 PM 10 0.0334 PM 10 0.0058 PM 2.5 000.003 000.004 000.020 000.002	0.0418 PM 2.5 0.0334 PM 2.5 0.0058	0.0150 CH4 0.0134 CH4 0.0030 NH3 000.024 000.024 000.0251 000.008	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e 00306.502 00398.336 00913.820 00311.249	
Emission Scrapers Emission Tractors Emission Vehicle I LDGV LDGV LDGT HDGV	Factors Composite Factors /Loaders/B Factors Exhaust & VOC 000.197 000.208 000.890	VOC 0.1671 VOC 0.1495 ackhoes Co VOC 0.0335 Worker Tr SO _x 000.002 000.003 000.003	SOx 0.0024 SOx 0.0026 mposite SOx 0.0007 ips Emissio NOx 000.094 000.168 000.817	NOx 0.8387 NOx 0.1857 n Factors (g 003.149 003.545 013.497	0.6620 CO 0.7186 CO 0.3586 grams/mile PM 10 000.003 000.005 000.022	0.0418 PM 10 0.0334 PM 10 0.0058 PM 2.5 000.003 000.004 000.020	0.0418 PM 2.5 0.0334 PM 2.5 0.0058	0.0150 CH4 0.0134 CH4 0.0030 NH3 000.024 000.026 000.051	CO2e 239.45 CO2e 262.81 CO2e 66.872 CO2e 00306.502 00398.336 00913.820	

19

HDDV

MC

15 16

18 **7.5.4 Paving Phase Formula(s)**

000.101

002.758

- 20 Construction Exhaust Emissions per Phase
- 21 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 2223 CEE_{POL}: Construction Exhaust Emissions (TONs)

000.004

000.003

002.293

000.620

001.540

012.221

000.042

000.023

000.038

000.020

- 24 NE: Number of Equipment
- 25 WD: Number of Total Work Days (days)
- 26 H: Hours Worked per Day (hours)

000.032

000.054

01238.796

00389.005

B-50 NOVEMBER 2023	
1 EF _{POL} : Emission Factor for Pollutant (lb/hour)	
2 2000: Conversion Factor pounds to tons	
34 - Vehicle Exhaust Emissions per Phase	
5 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$	
6	
 7 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 8 PA: Paving Area (ft²) 	
9 0.25: Thickness of Paving Area (ft)	
10 $(1/27)$: Conversion Factor cubic feet to cubic yards $(1 \text{ yd}^3/27 \text{ ft}^3)$	
11 HC: Average Hauling Truck Capacity (yd ³)	
12 $(1 / \text{HC})$: Conversion Factor cubic yards to trips $(1 \text{ trip} / \text{HC} \text{ yd}^3)$	
 HT: Average Hauling Truck Round Trip Commute (mile/trip) 14 	
15 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$	
16	
17 V _{POL} : Vehicle Emissions (TONs)	
18 VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)	
 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) 	
21 VM: Vehicle Exhaust On Road Vehicle Mixture (%)	
22 2000: Conversion Factor pounds to tons	
23	
 - Worker Trips Emissions per Phase - WD * WT * 1.25 * NE 	
25 $VMT_{WT} = WD * WT * 1.25 * NE$ 26	
27 VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)	
28 WD: Number of Total Work Days (days)	
29 WT: Average Worker Round Trip Commute (mile)	
30 1.25: Conversion Factor Number of Construction Equipment to Number of W	orks
NE: Number of Construction Equipment	
33 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$	
34	
35 V _{POL} : Vehicle Emissions (TONs)	
 36 VMT_{VE}: Worker Trips Vehicle Miles Travel (miles) 37 0.002205: Conversion Factor grams to pounds 	
 38 EF_{POL}: Emission Factor for Pollutant (grams/mile) 	
39 VM: Worker Trips On Road Vehicle Mixture (%)	
40 2000: Conversion Factor pounds to tons	
41 42 Off Cassing Emissions par Phase	
 42 - Off-Gassing Emissions per Phase 43 VOC_P = (2.62 * PA) / 43560 	
44	
45 VOC _P : Paving VOC Emissions (TONs)	
46 2.62: Emission Factor (lb/acre)	
47 PA: Paving Area (ft^2) 48 A2560: Conversion Factor square fact to core ($A2560$ ft2 / core) ² / core)	
48 43560: Conversion Factor square feet to acre $(43560 \text{ ft}2 / \text{ acre})^2 / \text{ acre})$ 49	
50	
51 8. Aircraft	
52	
53 8.1 General Information & Timeline Assumptions	
54	

```
1
      - Add or Remove Activity from Baseline?
                                                 Add
2
3
      - Activity Location
4
          County:
                    Taylor
5
          Regulatory Area(s):
                                NOT IN A REGULATORY AREA
6
7
      - Activity Title:
                        B-21 TGOs
8
9
     - Activity Description:
10
          2,280 annual TGOs
11
12
      - Activity Start Date
          Start Month:
13
                          1
14
          Start Year:
                          2025
15
      - Activity End Date
16
17
          Indefinite:
                          Yes
18
          End Month:
                          N/A
19
          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

22 23

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000
PM 10	0.000000

24	
25	

8.2 Aircraft & Engines

26 27 **8.2**

8.2.1 Aircraft & Engines Assumptions

28 29 - Aircraft & Engine 30 Aircraft Designation: B-2A **Engine Model:** F118-GE-100 31 32 **Primary Function:** Transport - Bomber 33 Aircraft has After burn: No 34 Number of Engines: 4 35 36 - Aircraft & Engine Surrogate 37 Is Aircraft & Engine a Surrogate? No 38 **Original Aircraft Name:** 39 **Original Engine Name:** 40 8.2.2 Aircraft & Engines Emission Factor(s) 41 42

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.744980
Pb	0.000000
NH ₃	0.000000
CO ₂ e	15180.9

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

B-52

1 - Aircraft & Engine Emissions Factors (lb/1000lb fuel)

- Aircraft & E			1					
	Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	\mathbf{CO}_2
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	323
Military	10887.00	0.03	1.07	33.12	0.65	1.64	1.48	323
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	323
8.3 Flight Op 8.3.1 Flight (Assumption	15					
- Flight Opera Number of	f Aircraft:	-				12	2	
	eration Cycle				se Pattern)			
	f Annual Flig			r all Aircraf	t :		280	
Number of	f Annual Trir	n Test(s) pe	r Aircraft:			0		
- Default Settin	ngs Used:	No						
- Flight Opera	tions TIMs (7	Time In Mo	(ab					
Taxi [Idle]			uc)	0				
	· · /	mins):		6.01				
Climb Out [Intermediate] (mins): 4.99								
Takeoff [N	f [Intermedia /iilitary] (min \fter Burn] (n	s):		4.99 0.68 0				
Takeoff [M Takeoff [A Per the Air Emi	Ailitary] (min After Burn] (n issions Guide 1	s): nins): for Air Force		0.68 0 urces, the def				
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n	Ailitary] (min After Burn] (n issions Guide i takeoff is 50% as used)): (mins): ate (mins): nins):	s): nins): for Air Force 6 military po 6 0 0 0 0 0		0.68 0 urces, the def				
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia	Ailitary] (min After Burn] (n issions Guide i takeoff is 50% as used)): (mins): ate (mins): nins):	s): nins): for Air Force 6 military po 6 0 0 0		0.68 0 urces, the def				
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn	Ailitary] (min After Burn] (min issions Guide i takeoff is 50% as used)): (mins): ate (mins): mins): a (mins):	s): nins): for Air Force 6 military po 6 0 0 0 0 0 0	ower and 509	0.68 0 urces, the def				
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n	Ailitary] (min After Burn] (min issions Guide i takeoff is 50% as used)): (mins): ate (mins): mins): a (mins):	s): nins): for Air Force 6 military po 6 0 0 0 0 0 0	ower and 509	0.68 0 urces, the def				
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (Ailitary] (min After Burn] (n issions Guide i takeoff is 50% as used)): (mins): ate (mins): nins): (mins): Dperations F	s): nins): for Air Force 6 military pc 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ower and 509	0.68 0 urces, the def % afterburner	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis	Ailitary] (min After Burn] (m issions Guide f takeoff is 50% as used)): (mins): ate (mins): nins): (mins): Dperations F ssions per Mo	s): nins): for Air Force 6 military pc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ower and 509	0.68 0 urces, the def % afterburner	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (Ailitary] (min After Burn] (m issions Guide f takeoff is 50% as used)): (mins): ate (mins): nins): (mins): Dperations F ssions per Mo	s): nins): for Air Force 6 military pc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ower and 509	0.68 0 urces, the def % afterburner	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emi AEM _{POL} = (TIM	Ailitary] (min After Burn] (min After Burn] (min Assions Guide for takeoff is 50% as used) (mins): (mins): (mins): (mins): Deparations H assions per Mo A / 60) * (FC /	s): nins): for Air Force 6 military po 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ower and 509 ht Operatio * NE * FOC	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emi AEM _{POL} = (TIM AEM _{POL} : A	Ailitary] (min After Burn] (min After Burn] (min issions Guide f takeoff is 50% as used)): (mins): ate (mins): mins): (mins): (mins): (mins): (mins): (Mins): Account for the second sec	s): nins): for Air Force 6 military po 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ower and 509 ht Operatio * NE * FOC	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emi AEM _{POL} = (TIN AEM _{POL} : A TIM: Time	Ailitary] (min After Burn] (min After Burn] (min issions Guide f iasons Guide f iakeoff is 50% as used) (mins): (mins): ate (mins): (mins):	s): nins): for Air Force 6 military po 0 0 0 0 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	h t Operatio * NE * FOC lutant & Mo	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emi AEM _{POL} = (TIM AEM _{POL} : A TIM: Tim 60: Conve	<pre>/ilitary] (min fter Burn] (n issions Guide f takeoff is 50% as used)): (mins): ate (mins): nins): a (mins): Dperations F ssions per Mo M / 60) * (FC / Aircraft Emisss e in Mode (mi rsion Factor m</pre>	s): nins): for Air Force 6 military po 6 0 0 0 Formula(s) ode for Fligh (1000) * EF bions per Pol n) ninutes to ho	h t Operatio * NE * FOC lutant & Mo	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emi AEM _{POL} = (TIM AEM _{POL} : A TIM: Time 60: Conve FC: Fuel F	<pre>/ilitary] (min /fter Burn] (min /fter Burn] (min // issions Guide f // takeoff is 50% // as used)): (mins): (mins): ate (mins): nins): (mins): (mins): (mins): Ate (mins): Deparations F // 60) * (FC // Aircraft Emission Factor min // 60 factor min flow Rate (lb/fin) // fow Rate (lb/fin) // for factor min flow Rate (lb/fin)</pre>	s): nins): for Air Force 6 military po 6 0 0 0 Formula(s) ode for Fligh (1000) * EF ions per Pol n) ninutes to ho nr)	h t Operatio * NE * FOC lutant & Mo urs	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis AEM _{POL} = (TIM AEM _{POL} : A TIM: Time 60: Conve FC: Fuel F 1000: Con	<pre>/ilitary] (min fter Burn] (n issions Guide f takeoff is 50% as used)): (mins): ate (mins): nins): a (mins): Dperations F ssions per Mo M / 60) * (FC / Aircraft Emisss e in Mode (mi rsion Factor m</pre>	s): nins): for Air Force 6 military pc 6 0 0 0 0 Formula(s) ode for Fligh 7 1000) * EF ions per Pol n) ninutes to ho nr) r pounds to 1	ht Operation * NE * FOC lutant & Mo urs 1000pounds	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis AEM _{POL} = (TIM AEM _{POL} : A TIM: Time 60: Conve FC: Fuel F 1000: Con EF: Emiss	Ailitary] (min After Burn] (min After Burn] (min Assions Guide for takeoff is 50% as used)): (mins): (mins): ate (mins): nins): (mins): Decrations F ssions per Mo A / 60) * (FC / Aircraft Emiss e in Mode (mi rsion Factor m Flow Rate (lb/h version Factor	s): nins): for Air Force 6 military pc 6 0 0 0 0 Formula(s) ode for Fligh 7 1000) * EF 5 cions per Pol n) ninutes to ho nr) r pounds to 1 7 (1000lb fuel)	ht Operation * NE * FOC lutant & Mo urs 1000pounds	0.68 0 urces, the def % afterburner n Cycles per C / 2000	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis AEM _{POL} = (TIN AEM _{POL} : A TIM: Time 60: Conve FC: Fuel F 1000: Con EF: Emiss NE: Numb	Ailitary] (min After Burn] (min After Burn] (min Aissions Guide f takeoff is 50% as used) (mins): (mins): ate (mins): mins): (mins): Operations Per Mon <i>A</i> / 60) * (FC / Aircraft Emission e in Mode (mins): Flow Rate (lb/flowersion Factor) ion Factor (lb/flowersion Factor) ion Factor (lb/flowersion Factor)	s): nins): for Air Force 6 military pc 6 0 0 0 0 Formula(s) ode for Fligh 7 1000) * EF ions per Pol n) ninutes to ho nr) r pounds to 1 7 1000lb fuel)	ht Operation * NE * FOC lutant & Mo urs 1000pounds	0.68 0 urces, the def % afterburner n Cycles per C/2000 de (TONs)	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis AEM _{POL} = (TIN AEM _{POL} = (TIN AEM _{POL} = (TIN Conve FC: Fuel F 1000: Conve FC: Fuel F 1000: Conve EF: Emiss NE: Num FOC: Nun	<pre>//ilitary] (min //initary] (min //initary] (min //initary] (min //initary) (mins): // (mins):</pre>	s): nins): for Air Force 6 military pc 6 military pc 0 0 0 0 0 Formula(s) ode for Fligh (1000) * EF ions per Pol n) ninutes to ho nr) r pounds to 1 (1000lb fuel) Operation C	ht Operation * NE * FOC lutant & Mo urs 1000pounds) ycles (for al	0.68 0 urces, the def % afterburner n Cycles per C/2000 de (TONs)	: (Exceptior			
Takeoff [M Takeoff [A Per the Air Emi after burner for flight profile wa - Trim Test Idle (mins) Approach Intermedia Military (n AfterBurn 8.3.2 Flight (- Aircraft Emis AEM _{POL} = (TIN AEM _{POL} = (TIN AEM _{POL} = (TIN Conve FC: Fuel F 1000: Conve FC: Fuel F 1000: Conve EF: Emiss NE: Num FOC: Nun	Ailitary] (min After Burn] (min After Burn] (min Aissions Guide f takeoff is 50% as used) (mins): (mins): (mins):	s): nins): for Air Force 6 military pc 6 military pc 0 0 0 0 Formula(s) ode for Fligh (1000) * EF cions per Pol n) ninutes to ho nr) r pounds to 1 (1000lb fuel) Operation C r pounds to 7	ht Operation * NE * FOC lutant & Mo urs 1000pounds) ycles (for all FONs	0.68 0 urces, the def % afterburner C / 2000 de (TONs)	: (Exceptior			

1	
2	AE _{FOC} : Aircraft Emissions (TONs)
3	AEM _{IDLE_IN} : Aircraft Emissions for Idle-In Mode (TONs)
4	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
5	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
6	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
7	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
8	
9	- Aircraft Emissions per Mode for Trim per Year
10	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
11	
12	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
13	TD: Test Duration (min)
14	60: Conversion Factor minutes to hours
15	FC: Fuel Flow Rate (lb/hr)
16	1000: Conversion Factor pounds to 1000pounds
17	EF: Emission Factor (lb/1000lb fuel)
18	NE: Number of Engines
19	NA: Number of Aircraft
20	NTT: Number of Trim Test
21	2000: Conversion Factor pounds to TONs
22	
23	- Aircraft Emissions for Trim per Year
24	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
25	
26	AE _{TRIM} : Aircraft Emissions (TONs)
27	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)
28	AEPS _{APPROACH} : Aircraft Emissions for Approach Power Setting (TONs)
29	AEPS _{INTERMEDIATE} : Aircraft Emissions for Intermediate Power Setting (TONs)
30	AEPS _{MILITARY} : Aircraft Emissions for Military Power Setting (TONs)
31	AEPS _{AFTERBURN} : Aircraft Emissions for After Burner Power Setting (TONs)
32	
33	
34	9. Aircraft
35	
36	9.1 General Information & Timeline Assumptions
37	•
38	- Add or Remove Activity from Baseline? Remove
39	·
40	- Activity Location
41	County: Taylor
42	Regulatory Area(s): NOT IN A REGULATORY AREA
43	
44	- Activity Title: B-1B Closed Patterns
45	
46	- Activity Description:
47	3,261 TGO annually
48	
49	- Activity Start Date
50	Start Month: 1
51	Start Year: 2025
52	
53	- Activity End Date
54	Indefinite: Yes

1	End Month:	N/A
2	End Year:	N/A

3

4 - Activity Emissions:

Pollutant Emissions Per Year (TON		
VOC	-0.180876	
SO _x	-4.931164	
NO _x	-52.153536	
CO -4.282033		
PM 10	-12.325752	

5 6

- Activity Emissions [Test Cell part]:

Activity Emissions [rest Cen part].			
Pollutant	Emissions Per Year (TONs)		
VOC	0.000000		
SO _x	0.000000		
NO _x	0.000000		
CO	0.000000		
PM 10	0.00000		

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

	8	-
11		
12	- Aircraft & Engine	
13	Aircraft Designation:	B-1B
14	Engine Model:	F101-GE-102
15	Primary Function:	Transport - Bomber
16	Aircraft has After burn:	Yes
17	Number of Engines:	4
18		
19	- Aircraft & Engine Surrogat	e
20	Is Aircraft & Engine a Su	rrogate? No
21	Original Aircraft Name:	
22	Original Engine Name:	
23		

24 9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

27

25 26

9.3 Flight Operations29

30 9.3.1 Flight Operations Assumptions

31

32	- Flight Operations			
33	Number of Aircraft:		12	
34	Flight Operation Cycle Type:	CP (Close Pattern)		
35	Number of Annual Flight Operation Cycles	for all Aircraft:	3261	
36	Number of Annual Trim Test(s) per Aircraf	ft:	0	

Pollutant	Emissions Per Year (TONs)
PM 2.5	-11.084040
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-14904.1

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

B-54

1				
2	- Default Settings Used: No			
3 4	Flight Operations TIMs (Time In Mode)			
4 5	- Flight Operations TIMs (Time In Mode) Taxi [Idle] (mins): 0			
6	Approach [Approach] (mins): 4.22			
7	Climb Out [Intermediate] (mins): 2.88			
8	Takeoff [Military] (mins):2.330.56			
9	Takeoff [After Burn] (mins):0.50			
10				
11	Per the Air Emissions Guide for Air Force Mobile Sources, the	lefaults values for military aircraft equipped with		
12	after burner for takeoff is 50% military power and 50% afterbur	• • • • • •		
13	flight profile was used)			
14				
15	- Trim Test			
16	Idle (mins): 0			
17	Approach (mins): 0			
18	Intermediate (mins): 0			
19	Military (mins): 0			
20	AfterBurn (mins): 0			
21				
22	9.3.2 Flight Operations Formula(s)			
23				
24	- Aircraft Emissions per Mode for Flight Operation Cycles J	er Year		
25	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$			
26				
27	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)		
28	TIM: Time in Mode (min)			
29	60: Conversion Factor minutes to hours			
30	FC: Fuel Flow Rate (lb/hr)			
31	1000: Conversion Factor pounds to 1000pounds			
32	EF: Emission Factor (lb/1000lb fuel)			
33	NE: Number of Engines			
34 25	FOC: Number of Flight Operation Cycles (for all aircraft) 2000: Conversion Factor pounds to TONs			
35 36	2000: Conversion Factor pounds to TONS			
30 37	- Aircraft Emissions for Flight Operation Cycles per Year			
38	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CI}$	$h = m + \Delta F M_{m}$, where $m = m + \Delta F M_{m}$		
39	ALFOC - ALMIDLE_IN + ALMIDLE_OUT + ALMAPPROACH + ALMICI	IMBOUT + ALIMTAKEOFF		
40	AE _{FOC} : Aircraft Emissions (TONs)			
41	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)			
42	AEM _{IDLE OUT} : Aircraft Emissions for Idle-Out Mode (TON	(s)		
43	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TO			
44	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (T			
45	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TON			
46	······ · · · · · · · · · · · · · · · ·	, ,		
47	- Aircraft Emissions per Mode for Trim per Year			
48	$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 20$	000		
49				
50	AEPSPOL: Aircraft Emissions per Pollutant & Power Settin	g (TONs)		
51	TD: Test Duration (min)			
52	60: Conversion Factor minutes to hours			
53	FC: Fuel Flow Rate (lb/hr)			
54	1000: Conversion Factor pounds to 1000pounds			
55	EF: Emission Factor (lb/1000lb fuel)			

B-20	NOVEMBER 2023				
1	NE: Number	of Engines			
2	NA: Number				
3	NTT: Number				
4		sion Factor pounds to TONs			
5		ns for Trim per Year			
6		$E + AEPS_{APPROACH} + AEPS_{INTERME}$	EDIATE + AE	$PS_{MILITARY} + AEPS$	AFTERBURN
7					
8	AE _{TRIM} : Aircr	aft Emissions (TONs)			
9		rcraft Emissions for Idle Power Se			
10		: Aircraft Emissions for Approac			
11		IATE: Aircraft Emissions for Intern)
12		Aircraft Emissions for Military I			
13	AEPSAFTERBUR	N: Aircraft Emissions for After B	urner Powe	r Setting (TONs)	
14					
15					
16	10. Aircraft				
17					
18	10.1 General In	formation & Timeline Assum	ptions		
19					
20	- Add or Remove	Activity from Baseline? Rem	ove		
21					
22	- Activity Location				
23		orden; Dawson; Fisher; Garza; Ke			
24	Regulatory A	rea(s): NOT IN A REGULATO	ORY AREA	Ą	
25					
26	- Activity Title:	B-1B Airspace Operations			
27					
28	- Activity Descript				
29	11,520 minute	s annually			
30	A attaite Start De	4.			
31 32	- Activity Start Da Start Month:				
	Start Month: Start Year:	1 2025			
33 34	Start Tear.	2023			
35	- Activity End Dat	to			
36	Indefinite:	Yes			
37	End Month:	N/A			
38	End Year:	N/A			
39					
40	- Activity Emissio	ns:			
	Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (
	VOC	-0.100716		PM 2.5	-3.046644
	SO _x	-2.694140		Pb	0.000000

SO _x	-2.694140
NO _x	-33.110227
СО	-2.140205
PM 10	-3.399149

Pollutant	Emissions Per Year (TONs)
PM 2.5	-3.046644
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-8142.8

- 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		

CO₂e

3234

3234

3234

3234

3234

1					
2	10.2 Aircraft	t & Engines			
3		C			
4	10.2.1 Aircra	aft & Engine	s Assumpt	ions	
5	- Aircraft & E	0	-		
6	Aircraft D	esignation:	B-1B		
7	Engine M	odel:	F101-GE	-102	
8	Primary F	unction:	Transpor	t - Bomber	
9	Aircraft h	as After burn	: Yes		
10	Number o	f Engines:	4		
11					
12	- Aircraft & E	ngine Surroga	ate		
13	Is Aircraft	t & Engine a S	Surrogate?	No	
14	0	ircraft Name	:		
15	Original E	Ingine Name:			
16					
17	10.2.2 Aircra	aft & Engine	s Emission	Factor(s)	
18					
19	- Aircraft & E	ngine Emissio	ons Factors	<u>(lb/1000lb f</u>	uel)
		Fuel Flow	VOC	SOx	
	Idle	1117.00	0.16	1.07	
	Approach	4533.00	0.02	1.07	
	Intermediate	6557.00	0.04	1.07	
	Military	7828.00	0.12	1.07	

21
22
23
24
25
26
27
•

20

10.3 Flight Operations

After Burn

10.3.1 Flight Operations Assumptions

15314.00

25	- Flight Operations		
26	Number of Aircraft:		120
27	Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
28	Number of Annual Flight Operation Cycle	es for all Aircraft:	1
29	Number of Annual Trim Test(s) per Airci	raft:	0
30			
31	- Default Settings Used: No		
32			
33	- Flight Operations TIMs (Time In Mode)		
34	Taxi [Idle] (mins):	0	
35	Approach [Approach] (mins):	0	
36	Climb Out [Intermediate] (mins):	11520	
37	Takeoff [Military] (mins):	0	
38	Takeoff [After Burn] (mins):	0	

1.46

1.07

38 39

40 Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with 41 after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2

NO_x

4.10

9.16

13.15

12.83

16.92

CO

24.46

1.03

0.85

0.83

43.49

PM 10

2.18

4.21

1.35

1.68

2.87

PM 2.5

1.96

3.79

1.21

1.51

2.58

42 flight profile was used) 43

75		
44	- Trim Test	
45	Idle (mins):	0
46	Approach (mins):	0
47	Intermediate (mins):	0
48	Military (mins):	0

B-58	NOVEMBER 2023
1	AfterBurn (mins): 0
$\frac{1}{2}$	Arter Burn (mms): 0
3	10.3.2 Flight Operations Formula(s)
4	10.5.2 Fight Operations Formula(s)
5	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
6	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
7	12MPOL = (1107700) (1C71000) E1 10C72000
8	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)
9	TIM: Time in Mode (min)
10	60: Conversion Factor minutes to hours
11	FC: Fuel Flow Rate (lb/hr)
12	1000: Conversion Factor pounds to 1000pounds
13	EF: Emission Factor (lb/1000lb fuel)
14	NE: Number of Engines
15	FOC: Number of Flight Operation Cycles (for all aircraft)
16	2000: Conversion Factor pounds to TONs
17	
18	- Aircraft Emissions for Flight Operation Cycles per Year
19	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
20	
21	AE _{FOC} : Aircraft Emissions (TONs)
22	AEM _{IDLE_IN} : Aircraft Emissions for Idle-In Mode (TONs)
23	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
24	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
25 26	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
26 27	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
27	- Aircraft Emissions per Mode for Trim per Year
28 29	- All craft Emissions per Mode for Trim per Tear $AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$
30	ALISPOL = (1D / 00) (1C / 1000) LI AL AA ATT / 2000
31	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
32	TD: Test Duration (min)
33	60: Conversion Factor minutes to hours
34	FC: Fuel Flow Rate (lb/hr)
35	1000: Conversion Factor pounds to 1000pounds
36	EF: Emission Factor (lb/1000lb fuel)
37	NE: Number of Engines
38	NA: Number of Aircraft
39	NTT: Number of Trim Test
40	2000: Conversion Factor pounds to TONs
41	
42	- Aircraft Emissions for Trim per Year
43	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
44	
45	AE_{TRIM} : Aircraft Emissions (TONs)
46	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)
47	AEPS _{APPROACH} : Aircraft Emissions for Approach Power Setting (TONs)
48 40	AEPS _{INTERMEDIATE} : Aircraft Emissions for Intermediate Power Setting (TONs)
49 50	AEPS _{MILITARY} : Aircraft Emissions for Military Power Setting (TONs)
50 51	AEPS _{AFTERBURN} : Aircraft Emissions for After Burner Power Setting (TONs)
51	

B.4.2 Dyess AFB Alternative Air Conformity Applicability Model Report Record Of Air Analysis (ROAA) 2

1

3 1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 4 an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force 5 Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process 6 (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a 7 summary of the ACAM analysis. 8 9 a. Action Location: 10 DYESS AFB **Base:** 11 State: Texas 12 **County(s):** Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall 13 **Regulatory Area(s):** NOT IN A REGULATORY AREA 14 15 b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess 16 AFB or Whiteman AFB 17 18 c. Project Number/s (if applicable): 19 20 d. Projected Action Start Date: 1 / 2025 21 22 e. Action Description: 23 24 Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at 25 installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide 26 the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an 27 era of renewed great power competition. The installation will support training of crewmembers and personnel in 28 the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide 29 sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations. 30 31 To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the 32 B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and 33 OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to 34 support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 35 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and 36 operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is 37 selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 38 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed 39 those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. 40 Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the 41 MOB 2 or MOB 3 beddown actions for either location. 42 43 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 44 45 operations, airspace and range utilization, facilities and infrastructure, and the WGF. 46 47 Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic 48 issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft 49 operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot 50 scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with 51 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. 52 53

1		
2	f. Point of Contact:	
3	Name:	Brad Boykin
4	Title:	CTR
5	Organization:	Leidos
6	Email:	boykinb@leidos.com
7	Phone Number:	571-521-8765
8		
9		
10	2. Air Impact Anal	ysis: Based on the attainment status at the action location, the requirements of the General
11	Conformity Rule are:	-
12		applicable
13		X not applicable
14		

15 Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year 16 basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) 17 emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all 18

algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for 19 Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air

- 20 Emissions Guide for Air Force Transitory Sources.
- 21

22 "Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts 23 to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards

24 (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major

25 source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) 26 and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions

27 occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a

28 significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with

29 net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the

30 action will not cause or contribute to an exceedance on one or more NAAOSs. For further detail on insignificance

31 indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume 32 II - Advanced Assessments.

33

34 The action's net emissions for every year through achieving steady state were compared against the Insignificance 35 Indicator and are summarized below.

36

37 **Analysis Summary:**

38 39

40

2025			
Pollutant Action Emissions INSIGNIFICANCE INDICATOR			
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA		
VOC	26.799	250	
NOx	98.629	250	
СО	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)			

2025

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

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

B-60

NOT IN A REGULATORY AREA			
VOC	2.615	250	
NOx	70.682	250	
СО	-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		

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.

5 6 7 8 9 10 Brad Boykin, CTR 11

4/2/2023 DATE

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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3

Dyess AFB Snapshot Scenario Detail Air Conformity Applicability Model **B.4.3** 1 Report 2

1. General Information

4	
5	- Action Location
6	Base: DYESS AFB
7	State: Texas
8	County(s): Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall
9	Regulatory Area(s): NOT IN A REGULATORY AREA
10	
11	- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess
12	AFB or Whiteman AFB
13	
14	- Project Number/s (if applicable):
15	
16	- Projected Action Start Date: 1 / 2025
17	
18	- Action Purpose and Need:
19	The purpose of the Proposed Action is to implement the goals of the National Defense Strategy by modernizing
20	the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional payloads and to
21 22	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.
22	particles through the Onited States' commitment to international reades.
23	The need for the Proposed Action stems from advancements in the technology that is available to potential
25	adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary
26	nations from taking action and that can respond effectively to support national defense priorities if and when called
27	upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and long-range
28	strike missions into the future; therefore, a new, more technologically capable system must be developed and fielded
29	to support the nation's defense.
30	11
31	
32	- Action Description:
33	Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at
34	installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the
35	only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of
36	renewed great power competition. The installation will support training of crewmembers and personnel in the
37	operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient
38	airfield, facilities, infrastructure, and airspace to support the B-21 training and operations.
39	
40	To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the
41	B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, as
42	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
43 44	(Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational activities
44	would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the MOB 2
46	location, then the remaining candidate base would subsequently become the MOB 3 beddown location. Air
47	operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in this EIS
48	and construction activities are anticipated to the be the same for either MOB location. Therefore, the analysis
49	presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 3 beddown
50	actions for either location.
51	

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.

11 12

13 - Point of Contact

10	1 01110 01 0011000	
14	Name:	Brad Boykin
15	Title:	CTR
16	Organization:	Leidos
17	Email:	boykinb@leidos.com
18	Phone Number:	571-521-8765
19		

20 - 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

21

22 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.

25 7 m r oree 11am

26

27 **2. Personnel**

28	
29	2.1 General Information & Timeline Assumptions
30	
31	- Add or Remove Activity from Baseline? Add
32	
33	- Activity Location
34	County: Taylor
35	Regulatory Area(s): NOT IN A REGULATORY AREA
36	
37	- Activity Title: Personnel - Military
38	
39	- Activity Description:
40	Military - 695
41	
42	- Activity Start Date
43	Start Month: 1
44	Start Year: 2025

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1	- Activity End Date	
2	Indefinite:	Yes
3	End Month:	N/A
4	End Year:	N/A

End Year: N/A

5 6

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.004025
SO _x	0.010439
NO _x	0.592392
СО	14.179602
PM 10	0.018274

7	
8	

- 2.2 Personnel Assumptions
- 9

- 10 - Number of Personnel 11 Active Duty Personnel:

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.015642
Pb	0.000000
NH ₃	0.102566
CO ₂ e	1448.6

11	Active Duty Personnel:	695	
12	Civilian Personnel:	0	
13	Support Contractor Personnel:	0	
14	Air National Guard (ANG) Personnel:	0	
15	Reserve Personnel:	0	
16			
17	- Default Settings Used: Yes		
18	-		
19	- Average Personnel Round Trip Commute (m	nile):	20 (default)
20			
21	- Personnel Work Schedule		
22	Active Duty Personnel:	5 Day	vs Per Week (de
23	Civilian Personnel:	5 Day	vs Per Week (de

21	- Personnel Work Schedule	
22	Active Duty Personnel:	5 Days Per Week (default)
23	Civilian Personnel:	5 Days Per Week (default)
24	Support Contractor Personnel:	5 Days Per Week (default)
25	Air National Guard (ANG) Personnel:	4 Days Per Week (default)
26	Reserve Personnel:	4 Days Per Month (default)
27		

28 2.3 Personnel On Road Vehicle Mixture 29

30 - 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

31

32 2.4 Personnel Emission Factor(s)

33 34

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
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

35

36 **2.5** Personnel Formula(s)

37 - Personnel Vehicle Miles Travel for Work Days per Year

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

NOVEMBER 2023 B-65

1	$VMT_P = NP * WD * AC$
2	
3	VMT _P : Personnel Vehicle Miles Travel (miles/year)
4	NP: Number of Personnel
5	WD: Work Days per Year
6 7	AC: Average Commute (miles)
8	- Total Vehicle Miles Travel per Year
9	$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$
10	
11	VMT _{Total} : Total Vehicle Miles Travel (miles)
12	VMT _{AD} : Active Duty Personnel Vehicle Miles Travel (miles)
13	VMT _C : Civilian Personnel Vehicle Miles Travel (miles)
14	VMT _{SC} : Support Contractor Personnel Vehicle Miles Travel (miles)
15	VMT _{ANG} : Air National Guard Personnel Vehicle Miles Travel (miles)
16	VMT _{AFRC} : Reserve Personnel Vehicle Miles Travel (miles)
17	
18	- Vehicle Emissions per Year
19	$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$
20	
21	V _{POL} : Vehicle Emissions (TONs)
22	VMT _{Total} : Total Vehicle Miles Travel (miles)
23 24	0.002205: Conversion Factor grams to pounds EF _{POL} : Emission Factor for Pollutant (grams/mile)
24 25	VM: Personnel On Road Vehicle Mixture (%)
25 26	2000: Conversion Factor pounds to tons
20 27	2000. Conversion ractor pounds to tons
28	
28 29	3. Personnel
29	3. Personnel
29 30	
29 30 31	3. Personnel3.1 General Information & Timeline Assumptions
29 30 31 32	3.1 General Information & Timeline Assumptions
29 30 31 32 33	
29 30 31 32 33 34	3.1 General Information & Timeline Assumptions- Add or Remove Activity from Baseline? Remove
29 30 31 32 33	 3.1 General Information & Timeline Assumptions - Add or Remove Activity from Baseline? Remove - Activity Location
29 30 31 32 33 34 35	3.1 General Information & Timeline Assumptions- Add or Remove Activity from Baseline? Remove
29 30 31 32 33 34 35 36	 3.1 General Information & Timeline Assumptions - Add or Remove Activity from Baseline? Remove - Activity Location County: Taylor
29 30 31 32 33 34 35 36 37	 3.1 General Information & Timeline Assumptions - Add or Remove Activity from Baseline? Remove - Activity Location County: Taylor
29 30 31 32 33 34 35 36 37 38	 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
29 30 31 32 33 34 35 36 37 38 39	 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
29 30 31 32 33 34 35 36 37 38 39 40	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	 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:
 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	 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
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	 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
 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 	 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
$\begin{array}{c} 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ \end{array}$	 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
 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 	 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
$\begin{array}{c} 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ \end{array}$	 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
 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 	 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

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 ₂ e	-200.1

1 2 3

3.2 Personnel Assumptions

4	- Number of Personnel	
5	Active Duty Personnel:	0
6	Civilian Personnel:	46
7	Support Contractor Personnel:	50
8	Air National Guard (ANG) Personnel:	0
9	Reserve Personnel:	0
10		
11	- Default Settings Used: Yes	
12		
13	- Average Personnel Round Trip Commute (1	mile): 20 (default)
14		
15	- Personnel Work Schedule	
16	Active Duty Personnel:	5 Days Per Week (default)
17	Civilian Personnel:	5 Days Per Week (default)
18	Support Contractor Personnel:	5 Days Per Week (default)
19	Air National Guard (ANG) Personnel:	4 Days Per Week (default)
20	Reserve Personnel:	4 Days Per Month (default)
21		

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

25 26

22

23 24

3.4 Personnel Emission Factor(s)

27 28

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
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

29

30 **3.5 Personnel Formula(s)**

31

32 - Personnel Vehicle Miles Travel for Work Days per Year

- $33 \qquad VMT_P = NP * WD * AC$
- 34
- 35 VMT_P: Personnel Vehicle Miles Travel (miles/year)
- 36 NP: Number of Personnel
- 37 WD: Work Days per Year

1	AC: Average	Commute (miles)	
2	T 4 1 7 1 • 1 N	21 /TL 1 57	
3		lles Travel per Year	
4	$VMT_{Total} = VMT_{AL}$	$D + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AF}$	RC
5			
6		al Vehicle Miles Travel (miles)	
7		ve Duty Personnel Vehicle Miles Travel (1	
8		an Personnel Vehicle Miles Travel (miles)	
9		ort Contractor Personnel Vehicle Miles Tr	
10		National Guard Personnel Vehicle Miles	. ,
11	VMT _{AFRC} : Re	serve Personnel Vehicle Miles Travel (mi	les)
12			
13	- Vehicle Emission		
14	$V_{POL} = (VMT_{Total} *$	0.002205 * EF _{POL} * VM) / 2000	
15			
16		Emissions (TONs)	
17		al Vehicle Miles Travel (miles)	
18		nversion Factor grams to pounds	
19		on Factor for Pollutant (grams/mile)	
20		el On Road Vehicle Mixture (%)	
21	2000: Conver	sion Factor pounds to tons	
22			
23			
24	4. Aircraft		
28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	 Activity Location County: Ta Regulatory A Activity Title: Activity Descript 1,140 annual L Activity Start Da Start Month: Start Year: Activity End Date 	nylor rea(s): NOT IN A REGULATORY AF B-21 tion: .TOs nte 1 2025 te	REA
44	Indefinite:	Yes	
45	End Month:	N/A	
46	End Year:	N/A	
47			
48	- Activity Emissio	ns:	
	Pollutant	Emissions Per Year (TONs)	Pollutant
	VOC	5.620168	PM 2.5
	SO _x	9.627475	Pb
	NO _x	147.498209	NH ₃
	CO	63.257429	CO ₂ e
	PM 10	15.164314	

Pollutant	Emissions Per Year (TONs)
PM 2.5	13.427448
Pb	0.000000
NH ₃	0.000000
CO ₂ e	21335.5

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	2.667392	PM 2.5	11.103008
SO _x	5.847604	Pb	0.000000
NO _x	73.380182	NH ₃	0.000000
CO	42.622448	CO ₂ e	17844.6
PM 10	12.741708		

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

6		
7	- Aircraft & Engine	
8	Aircraft Designation:	B-2A
9	Engine Model:	F118-GE-100
10	Primary Function:	Transport - Bomber
11	Aircraft has After burn:	No
12	Number of Engines:	4
13		
14	- Aircraft & Engine Surrogat	e
15	Is Aircraft & Engine a Su	irrogate? No
16	Original Aircraft Name:	
17	Original Engine Name:	
18		
19	4.2.2 Aircraft & Engines E	Emission Factor(s)

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

22 23

21

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

2627 - Flight Operati

27	- Flight Operations		
28	Number of Aircraft:		12
29	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
30	Number of Annual Flight Operatio	n Cycles for all Aircraft:	1140
31	Number of Annual Trim Test(s) per	r Aircraft:	12
32			
33	- Default Settings Used: No		
34			
35	- Flight Operations TIMs (Time In Mod	le)	
36	Taxi [Idle] (mins):	22.66	
37	Approach [Approach] (mins):	7.37	
38	Climb Out [Intermediate] (mins):	1.41	
39	Takeoff [Military] (mins):	1.06	
40	Takeoff [After Burn] (mins):	0	

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

3 flight profile was used)

4	
5	- Trim Test
6	Idle (mins): 12
7	Approach (mins): 27
8	Intermediate (mins): 9
9	Military (mins): 12
10	AfterBurn (mins): 0
10	
12	4.3.2 Flight Operations Formula(s)
12	4.5.2 Flight Operations Formula(s)
13	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
15	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
16	
17	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)
18	TIM: Time in Mode (min)
19	60: Conversion Factor minutes to hours
20	FC: Fuel Flow Rate (lb/hr)
21	1000: Conversion Factor pounds to 1000pounds
22	EF: Emission Factor (lb/1000lb fuel)
23	NE: Number of Engines
24	FOC: Number of Flight Operation Cycles (for all aircraft)
25	2000: Conversion Factor pounds to TONs
26	2000. Conversion ractor pounds to 10143
20	- Aircraft Emissions for Flight Operation Cycles per Year
28	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
28 29	ALFOC - ALWIDLE_IN + ALWIDLE_OUT + ALWIAPPROACH + ALWICLIMBOUT + ALWIAKEOFF
30	AE _{FOC} : Aircraft Emissions (TONs)
31	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)
32	$AEM_{IDLE_{OUT}}$: Aircraft Emissions for Idle-Out Mode (TONs)
33	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
34	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
35	$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)
36	ALMIAREOFF. A Merall Linissions for Take Off Mode (10103)
37	- Aircraft Emissions per Mode for Trim per Year
38	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
39	$M_{\rm H} = (10, 00)$ (10, 1000) Er (10, 101, 2000)
40	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
41	TD: Test Duration (min)
42	60: Conversion Factor minutes to hours
43	FC: Fuel Flow Rate (lb/hr)
44	1000: Conversion Factor pounds to 1000pounds
45	EF: Emission Factor (lb/1000lb fuel)
46	NE: Number of Engines
47	NA: Number of Aircraft
48	NTT: Number of Trim Test
49	2000: Conversion Factor pounds to TONs
50	2000. Conversion ractor pounds to 10143
51	- Aircraft Emissions for Trim per Year
52	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
53	
54	AE _{TRIM} : Aircraft Emissions (TONs)
55	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)

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- AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)
 AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs)
- 3 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)
 - AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)
 - AEPSAFTERBURN: Aircraft Emissions for After Burner Power Setting (TONS

4.4 Auxiliary Power Unit (APU)

4.4.1 Auxiliary Power Unit (APU) Assumptions

10 - Default Settings Used: Yes

11 12

4

5 6

7 8

9

- Auxiliary Power Unit (APU) (default)

Tummury 100001 C	rushing rower onit (in o) (default)									
Number of APU	Operation	Exempt	Designation	Manufacturer						
per Aircraft	Hours for Each	Source?								
	LTO									
2	4	No	131-3A							

13 14

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

15 16

- Auviliary Power Unit (APU) Emission Factor (1b/br)

Designation	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

48

18 19 20 21 22

23

24

25

28

29

33 34

35

36

17

- Auxiliary Power Unit (APU) Emissions per Year

4.4.3 Auxiliary Power Unit (APU) Formula(s)

 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

- APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
- APU: Number of Auxiliary Power Units
- OH: Operation Hours for Each LTO (hour)
- 26 LTO: Number of LTOs 27 EF_{POI}: Emission Factor
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons
- 30 4.5 Aircraft Engine Test Cell
- 3132 4.5.1 Aircraft Engine Test Cell Assumptions
 - Engine Test Cell
 - Total Number of Aircraft Engines Tested Annually:

37 - Default Settings Used: No38

- 39 - Annual Run-ups / Test Durations 40 **Annual Run-ups (Per Aircraft Engine):** 1 **Idle Duration** (mins): 41 12 **Approach Duration (mins):** 27 42 **Intermediate Duration (mins):** 9 43 12 44 **Military Duration (mins):** 45 After Burner Duration (mins): 0 46
- 47 **4.5.2** Aircraft Engine Test Cell Emission Factor(s)

					NOVEWIDER 2023					
1	- See Aircraft & Eng	gines Emission Fact	or(s)							
2 3	4.5.3 Aircraft Eng	ning Test Call For	mula(c)							
3 4	4.5.5 AIICIAIT EIIş	gine Test Cen For	iiula(s)							
5	- Aircraft Engine Te	est Cell Emissions p	er Pollutan	t & Power Setting (TONs	3)					
6	$TestCellPS_{POL} = (TD)$,					
7		, , , ,								
8			Cell Emissio	ons per Pollutant & Power	Setting (TONs)					
9		TD: Test Duration (min)								
10		60: Conversion Factor minutes to hours								
11		FC: Fuel Flow Rate (lb/hr)								
12		on Factor pounds to 1								
13		actor (lb/1000lb fuel)								
14		per of Engines (For A								
15 16		un-ups (Per Aircraft on Factor pounds to T								
10	2000. Conversio	ni racior pounds to r	UNS							
18	- Aircraft Engine Te	est Cell Emissions p	er Year							
19				stCellPS _{INTERMEDIATE} + Tes	StCellPSmilitary +					
20	TestCellPS _{AFTERBURN}		i konen							
21										
22	TestCell: Aircra	ft Engine Test Cell E	missions (T	ONs)						
23	TestCellPS _{IDLE} :	Aircraft Engine Test	Cell Emissi	ons for Idle Power Setting	(TONs)					
24				missions for Approach Pov						
25				ll Emissions for Intermedia						
26				nissions for Military Powe						
27	TestCellPS _{AFTERI}	BURN: Aircraft Engine	e Test Cell I	Emissions for After Burner	Power Setting (TONs)					
28										
29	4.6 Aerospace Gr	ound Equipment ((AGE)							
30		·····								
31	4.6.1 Aerospace G	rouna Equipmen	t (AGE) A	ssumptions						
32 33	- Default Settings Us	sed: Yes								
33 34	- Default Settings Of	Seu. 168								
35	- AGE Usage									
36		ual LTO (Landing a	and Take-o	ff) cvcles for AGE: 1	140					
37										
38	- Aerospace Ground	l Equipment (AGE)	(default)							
	Total Number of	Operation Hours	Exempt	AGE Type	Designation					
	AGE	for Each LTO	Source?							
	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					
		1.5	No	Hydraulic Test Stand	MJ-2/TTU-229					
	1	4	No	Light Cart	NF-2					
	1	2	No	Start Cart	A/M32A-60A					

40 4.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

41 42

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	CO ₂ e
-------------	--------------	-----	-----	-----	----	-------	--------	-------------------

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

```
19
      - Add or Remove Activity from Baseline?
                                               Remove
20
21
      - Activity Location
22
          County:
                    Taylor
23
          Regulatory Area(s):
                               NOT IN A REGULATORY AREA
24
```

25 - Activity Title: **B-1B LTOs** 26

- 27 - Activity Description: 28 937.6 LTOs annually
- 29 30 - Activity Start Date
- 31 **Start Month:** 1 32
 - **Start Year:** 2025
- 33 34 - Activity End Date 35 **Indefinite:**
- Yes 36 **End Month:** N/A
- 37 **End Year:** N/A
- 38
- 39 - Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-3.097208
SO _x	-5.327344
NO _x	-62.323079
СО	-71.309629
PM 10	-12.738686

Pollutant	Emissions Per Year (TONs)
PM 2.5	-11.405325
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-14258.3

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B-72

1

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-2.018741	PM 2.5	-10.730637
SO _x	-4.661369	Pb	0.000000
NO _x	-44.890818	NH ₃	0.000000
CO	-66.253254	CO ₂ e	-13034.2
PM 10	-12.013862		

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

•		
6		
7	- Aircraft & Engine	
8	Aircraft Designation:	B-1B
9	Engine Model:	F101-GE-102
10	Primary Function:	Transport - Bomber
11	Aircraft has After burn:	Yes
12	Number of Engines:	4
13		
14	- Aircraft & Engine Surrogat	e
15	Is Aircraft & Engine a Su	irrogate? No
16	Original Aircraft Name:	
17	Original Engine Name:	
18		
19	5.2.2 Aircraft & Engines E	Emission Factor(s)

5.2.2 Aircraft & Engines Emission Factor(s) 20

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO _x	NO _x	СО	PM 10	PM 2.5	CO ₂ e
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

22 23

21

5.3 Flight Operations

24 25 **5.3.1 Flight Operations Assumptions**

26 27 - Flight Operations

21	- right Operations		
28	Number of Aircraft:		12
29	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
30	Number of Annual Flight Operation Cy	cles for all Aircraft:	937.6
31	Number of Annual Trim Test(s) per Air	craft:	12
32			
33	- Default Settings Used: No		
34	-		
35	- Flight Operations TIMs (Time In Mode)		
36	Taxi [Idle] (mins):	22.66	
37	Approach [Approach] (mins):	6.09	
38	Climb Out [Intermediate] (mins):	1.3	
39	Takeoff [Military] (mins):	0	
40	Takeoff [After Burn] (mins):	1.44	
41			

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1	Per the Air Emissions Guide for	or Air Force Mobile Sources, the defaults values for military aircraft equipped with
2		military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2
3	flight profile was used)	
4		
5	- Trim Test	
6	Idle (mins):	12
7	Approach (mins):	27
8	Intermediate (mins):	9
9	Military (mins):	9
10	AfterBurn (mins):	3
11		
12	5.3.2 Flight Operations F	ormula(s)
13	8	
14	- Aircraft Emissions per Mo	le for Flight Operation Cycles per Year
15		1000) * EF * NE * FOC / 2000
16		,
17	AEM _{POL} : Aircraft Emissi	ons per Pollutant & Mode (TONs)
18	TIM: Time in Mode (min)
19	60: Conversion Factor mi	nutes to hours
20	FC: Fuel Flow Rate (lb/h	r)
21	1000: Conversion Factor	pounds to 1000pounds
22	EF: Emission Factor (lb/1	000lb fuel)
23	NE: Number of Engines	
24		Operation Cycles (for all aircraft)
25	2000: Conversion Factor	pounds to TONs
26		
27		nt Operation Cycles per Year
28	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{III}$	$ALE_OUT + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
29		
30	AE _{FOC} : Aircraft Emission	
31		issions for Idle-In Mode (TONs)
32		nissions for Idle-Out Mode (TONs)
33		missions for Approach Mode (TONs)
34		missions for Climb-Out Mode (TONs)
35	AEM _{TAKEOFF} : Aircraft En	nissions for Take-Off Mode (TONs)
36		
37	- Aircraft Emissions per Mo	
38	$AEPS_{POL} = (1D / 60) * (FC / 1)$	000) * EF * NE * NA * NTT / 2000
39 40	AEDS Ainstaft Engine	Tons non Dellatort & Down Setting (TONs)
40 41	TD: Test Duration (min)	ions per Pollutant & Power Setting (TONs)
42	60: Conversion Factor mi	nutos to hours
42	FC: Fuel Flow Rate (lb/h	
43 44	1000: Conversion Factor	
45	EF: Emission Factor (lb/1	
46	NE: Number of Engines	
47	NA: Number of Aircraft	
48	NTT: Number of Trim Te	est
49	2000: Conversion Factor	
50		
51	- Aircraft Emissions for Trin	n per Year
52		$_{PROACH}$ + AEPS _{INTERMEDIATE} + AEPS _{MILITARY} + AEPS _{AFTERBURN}
53		
54	AE _{TRIM} : Aircraft Emissio	ns (TONs)
55		ions for Idle Power Setting (TONs)

1

AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)

- AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs)
- AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)
- AEPSAFTERBURN: Aircraft Emissions for After Burner Power Setting (TONs)

6 5.4 Auxiliary Power Unit (APU)

5.4.1 Auxiliary Power Unit (APU) Assumptions

10 - Default Settings Used: Yes

11 12

7 8

9

- 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	

13 14

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

15 16

- Auxiliary Power Unit (APU) Emission Factor (1b/hr)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	CO ₂ e
GTCP 165-9	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

18 19 20 21 22

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- Auxiliary Power Unit (APU) Emissions per Year

5.4.3 Auxiliary Power Unit (APU) Formula(s)

 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

- APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
- APU: Number of Auxiliary Power Units
- OH: Operation Hours for Each LTO (hour)
- 26LTO: Number of LTOs27EFPOI: Emission Factor
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons
- 30 5.5 Aircraft Engine Test Cell
- 3132 5.5.1 Aircraft Engine Test Cell Assumptions
- 33
 34 Engine Test Cell
 35 Total Number of Aircraft Engines Tested Annually: 48

37 - Default Settings Used: No38

- 39 - Annual Run-ups / Test Durations 40 **Annual Run-ups (Per Aircraft Engine):** 1 **Idle Duration** (mins): 41 12 27 42 **Approach Duration (mins):** 9 43 **Intermediate Duration (mins):** 9 44 **Military Duration (mins):** 45 After Burner Duration (mins): 3 46
- 47 **5.5.2** Aircraft Engine Test Cell Emission Factor(s)

6	NOVEMBER 2023								
	- See Aircraft & Eng	gines Emission Fact	or(s)						
	5.5.3 Aircraft Eng	gine Test Cell Fori	nula(s)						
	Ainene fá Eneine T	at Call Emissions -	an Dallatan	· · Pomon Cotting (TONs)					
	- Aircraft Engine 10 TestCellPS _{POL} = (TD)			t & Power Setting (TONs))				
	1 escent Spol = (1D)	(IC / 1000) ·	EL INE -	AKU / 2000					
	TestCellPSpor:	Aircraft Engine Test	Cell Emissio	ons per Pollutant & Power	Setting (TONs)				
	TD: Test Durati	Ũ		r					
		Factor minutes to hou	ırs						
	FC: Fuel Flow I	Rate (lb/hr)							
		on Factor pounds to 1							
		actor (lb/1000lb fuel)							
		ber of Engines (For A							
		un-ups (Per Aircraft							
	2000: Conversio	on Factor pounds to T	ONS						
	Ainonaft Engine T	oot Coll Englandar	ver Ver						
	- Aircraft Engine To	-		stCellPS _{INTERMEDIATE} + Tes	tCallDS				
	TestCellPS _{AFTERBURN}		PROACH + 10	SICCHIPSINTERMEDIATE + 108	Cent Smilitary +				
	Testeen SAFTERBURN								
	TestCell: Aircra	ft Engine Test Cell E	missions (T	ONs)					
				ons for Idle Power Setting	(TONs)				
				missions for Approach Pov					
				ll Emissions for Intermedia					
	TestCellPS _{MILITA}	RY: Aircraft Engine	Test Cell Er	nissions for Military Power	r Setting (TONs)				
	TestCellPS _{AFTER}	BURN: Aircraft Engine	e Test Cell I	Emissions for After Burner	Power Setting (TONs)				
	5.6 Aerospace Gr	ound Equipment ((AGE)						
	5.6.1 Aerospace (Fround Equipmen	t (AGE) A	ssumptions					
	- Default Settings U	and. Vac							
	- Default Settings U	sed: Yes							
	- AGE Usage								
	e	ual LTO (Landing a	and Take-o	ff) cvcles for AGE: 93	37.6				
		l Equipment (AGE)	(default)						
	Total Number of	Operation Hours	Exempt	AGE Type	Designation				
	AGE	for Each LTO	Source?						
	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 No	Light Cart Start Cart	NF-2 A/M32A-95				

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO _x	NO _x	СО	PM 10	PM 2.5	CO ₂ e
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

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H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
B-1B Heater/Air	17.1	0.258	0.121	7.659	1.409	0.152	0.148	389.3
Conditioner								
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

	1
	1 2
	3
	4 5
	6
	0 7 8 9 0
	9
1 1	0
1	1 2
1	2 3
1	4 5
1	5 6
1	7
1	7 8 9
2	0
2 2 2	1
2	2 3
2	4 5
2	6
$\frac{2}{2}$	6 7
2	, 8 9
3	0
3	1
3	2 3
3	4 5
3	5 6
3	6 7

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	ner Pollutant ((TONs)
AOLP(), $AOOSPACC$	Olound Lyuphicht	(AOL) Linissions	per i onutant	

- 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

18		
19	- Activity Location	1
20	County: Ta	ylor
21	Regulatory A	rea(s): NOT IN A REGULATORY AREA
22		
23	- Activity Title:	Dyess Construction
24		
25	- Activity Descript	ion:
26	See Section 2.3	3.5
27		
28	- Activity Start Da	ite
29	Start Month:	1
30	Start Month:	2025
31		
32	- Activity End Dat	e
33	Indefinite:	False
34	End Month:	12
35	End Month:	2025
36		
37	- Activity Emission	
	Pollutant	Total Emissions (TONs)
	VOC	21.232793 PI

VOC	21.232793
SO _x	0.051361
NO _x	16.884463
CO	18.931890
PM 10	572.728795

38

39 6.1 Demolition Phase

40

41 **6.1.1 Demolition Phase Timeline Assumptions**

42

Pollutant	Total Emissions (TONs)
PM 2.5	0.630445
Pb	0.000000
NH ₃	0.030575
CO ₂ e	5705.6

B-78 NOVEMBER 2023 1 - Phase Start Date 2 Start Month: 1 3 Start Quarter: 1 4 Start Year: 2025 5 6 - Phase Duration 7 Number of Month: 12 8 Number of Days: 0 9 10 6.1.2 Demolition Phase Assumptions 11 12 - General Demolition Information Area of Building to be demolished (ft²): 13 63441 Height of Building to be demolished (ft): 25 14 15 16 - Default Settings Used: Yes 17 18 - Average Day(s) worked per week: 5 (default) 19 20 - Construction Exhaust (default) **Equipment Name** Number Of **Hours Per Day** Equipment Concrete/Industrial Saws Composite 8 1 Rubber Tired Dozers Composite 1 1 Tractors/Loaders/Backhoes Composite 2 6 21 22 - Vehicle Exhaust 23 Average Hauling Truck Capacity (yd³): 20 (default) 24 Average Hauling Truck Round Trip Commute (mile): 20 (default) 25 26 - Vehicle Exhaust Vehicle Mixture (%) LDGV LDGT HDGV LDDV LDDT **HDDV** MC POVs 0 0 0 0 100.00 0 0 27 28 - Worker Trips 29 Average Worker Round Trip Commute (mile): 20 (default) 30 31 - Worker Trips Vehicle Mixture (%) HDGV LDDV LDGV LDDT HDDV MC LDGT POVs 50.00 50.00 0 0 0 0 0 32 33 6.1.3 Demolition Phase Emission Factor(s) 34 35 - Construction Exhaust Emission Factors (lb/hour) (default) **Concrete/Industrial Saws Composite** VOC NO_x **SO**_x СО **PM 10** PM 2.5 CH₄ CO₂e **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 CH₄ CO₂e **Emission Factors** 0.1671 0.0024 1.0824 0.6620 0.0418 0.0418 0.0150 239.45 Tractors/Loaders/Backhoes Composite **PM 10** PM 2.5 VOC **SO**_x **NO**_x CO CH₄ CO₂e 0.0335 0.0007 0.0058 0.0030 **Emission Factors** 0.1857 0.3586 0.0058 66.872

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 \mathbf{NH}_3 VOC SO_x **NO**_x CO **PM 10** PM 2.5 Pb CO₂e LDGV 000.197 000.002 000.094 003.149 000.003 000.003 000.024 00306.502 000.208 000.003 003.545 000.005 000.026 00398.336 LDGT 000.168 000.004 00913.820 HDGV 000.890 000.006 000.817 013.497 000.022 000.020 000.051 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 000.101 000.004 002.293 001.540 000.038 000.032 01238.796 000.042 MC 002.758 000.003 000.620 012.221 000.023 000.020 000.054 00389.005

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

2
3
4
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10
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12
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16 17
18 19
20
20
21
23
24 25
25 26
26

6.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (0.00042 * BA * BH) / 2000$

/	
8	PM10 _{FD} : Fugitive Dust PM 10 Emissions (TONs)
9	0.00042: Emission Factor (lb/ft ³)
10	BA: Area of Building to be demolished (ft ²)
11	BH: Height of Building to be demolished (ft)
12	2000: Conversion Factor pounds to tons
13	-
14	- Construction Exhaust Emissions per Phase
15	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
16	
17	CEE _{POL} : Construction Exhaust Emissions (TONs)
18	NE: Number of Equipment
19	WD: Number of Total Work Days (days)
20	H: Hours Worked per Day (hours)
21	EF _{POL} : Emission Factor for Pollutant (lb/hour)
22	2000: Conversion Factor pounds to tons
23	
24	- Vehicle Exhaust Emissions per Phase
25	$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$
26	
27	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
28	BA: Area of Building being demolish (ft ²)
29	BH: Height of Building being demolish (ft)
30	$(1 / 27)$: Conversion Factor cubic feet to cubic yards $(1 \text{ yd}^3 / 27 \text{ ft}^3)$
31	0.25: Volume reduction factor (material reduced by 75% to account for air space)
32	HC: Average Hauling Truck Capacity (yd ³)
33	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
34	HT: Average Hauling Truck Round Trip Commute (mile/trip)
35	
36	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
37	
38	V _{POL} : Vehicle Emissions (TONs)
39	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
40	0.002205: Conversion Factor grams to pounds
41	EF _{POL} : Emission Factor for Pollutant (grams/mile)
42	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
43	2000: Conversion Factor pounds to tons
44	Western Tring Fraissiens - on Dhees
45	- Worker Trips Emissions per Phase
46	$VMT_{WT} = WD * WT * 1.25 * NE$

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1	VMT _{wT} : Worker Trips Vehicle Miles Travel (miles)		
2	WD: Number of Total Work Days (days)		
3	WT: Average Worker Round Trip Commute (mile)		
4	1.25: Conversion Factor Number of Construction Equipment to Nu	mber of Works	
5	NE: Number of Construction Equipment		
6 7	V _{POL} = (VMT _{WT} * 0.002205 * EF _{POL} * VM) / 2000		
8			
9	V _{POL} : Vehicle Emissions (TONs)		
10	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
11	0.002205: Conversion Factor grams to pounds		
12	EF_{POL} : Emission Factor for Pollutant (grams/mile)		
13	VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons		
14 15	2000. Conversion Factor pounds to tons		
16	6.2 Site Grading Phase		
17			
18	6.2.1 Site Grading Phase Timeline Assumptions		
19 20	- Phase Start Date		
20	Start Month: 1		
22	Start Quarter: 1		
23	Start Year: 2025		
24			
25	- Phase Duration		
26	Number of Month: 12		
27	Number of Days: 0		
28			
29 20	6.2.2 Site Grading Phase Assumptions		
30 31	- General Site Grading Information		
31	Area of Site to be Graded (ft ²): 4764407.8		
33	Amount of Material to be Hauled On-Site (yd ³): 476		
34	Amount of Material to be Hauled Off-Site (yd ³): 476		
35			
36	- Site Grading Default Settings		
37	Default Settings Used: Yes		
38	Average Day(s) worked per week: 5 (default)		
39 40			
40	- Construction Exhaust (default) Equipment Name	Number Of	Hours Per Day
	Equipment Ivanie	Equipment	IIIUIISI CI 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
41			
42 43	- Vehicle Exhaust Average Hauling Truck Capacity (yd ³): 20 (def	oult)	
43 44	Average Hauling Truck Capacity (yu'): 20 (def Average Hauling Truck Round Trip Commute (mile): 20 (def	,	
45	20 (del	uuitj	
46	- Vehicle Exhaust Vehicle Mixture (%)		
DRAFT	I ENVIRONMENTAL IMPACT STATEMENT		

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	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	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Other Construction Equipment Composite							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozers Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SOx	NOx	СО	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	SOx	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

10 11

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

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13 6.2.4 Site Grading Phase Formula(s)

15 - Fugitive Dust Emissions per Phase

16 $PM10_{FD} = (20 * ACRE * WD) / 2000$

- 18 PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 19 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 20 ACRE: Total acres (acres)
- 21 WD: Number of Total Work Days (days)
- 22 2000: Conversion Factor pounds to tons23
- 24 Construction Exhaust Emissions per Phase

10

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1	CEE _{POL} = (NE * WD * H * EF _{POL}) / 2000							
2								
3	CEE _{POL} : Construction Exhaust Emissions (TONs)							
4	NE: Number of Equipment							
5	WD: Number of Total Work Days (days)							
6	H: Hours Worked per Day (hours)							
7 8	EF _{POL} : Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons							
9	2000. Conversion Factor pounds to tons							
10	- Vehicle Exhaust Emissions per Phase							
11	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$							
12								
13	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)							
14	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)							
15	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd^3)							
16	HC: Average Hauling Truck Capacity (yd^3)							
17 18	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³) HT: Average Hauling Truck Round Trip Commute (mile/trip)							
18	III. Average mauning muck Round Imp Commute (inne/unp)							
20	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$							
21								
22	V _{POL} : Vehicle Emissions (TONs)							
23	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)							
24	0.002205: Conversion Factor grams to pounds							
25	EF _{POL} : Emission Factor for Pollutant (grams/mile)							
26 27	VM: Vehicle Exhaust On Road Vehicle Mixture (%)							
27 28	2000: Conversion Factor pounds to tons							
28 29	- Worker Trips Emissions per Phase							
30	$VMT_{WT} = WD * WT * 1.25 * NE$							
31								
32	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)							
33	WD: Number of Total Work Days (days)							
34	WT: Average Worker Round Trip Commute (mile)							
35	1.25: Conversion Factor Number of Construction Equipment to Number of Works							
36	NE: Number of Construction Equipment							
37 38	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$							
39	$v_{POL} = (v_{POL} v_{POL} v$							
40	V _{POL} : Vehicle Emissions (TONs)							
41	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)							
42	0.002205: Conversion Factor grams to pounds							
43	EF _{POL} : Emission Factor for Pollutant (grams/mile)							
44	VM: Worker Trips On Road Vehicle Mixture (%)							
45	2000: Conversion Factor pounds to tons							
46	6.2 Two poly a final phase							
47 48	6.3 Trenching/Excavating Phase							
49	6.3.1 Trenching / Excavating Phase Timeline Assumptions							
50	were a containing a stream working a mass a material transform provide							
51	- Phase Start Date							
52	Start Month: 1							
53	Start Quarter: 1							
54	Start Year: 2025							

1 2 3 4	- Phase Duratio Number of Number of	Month: 12							
5	6.3.2 Trenchi	ng / Excavati	ng Phase As	sumptions					
6 7 8 9 10 11 12	Amount of Amount of	e to be Trench Material to be Material to be	ed/Excavated Hauled On-S	(ft ²): Site (yd ³):	25200 2.5 2.5				
12 13 14 15	- Trenching De Default Set Average Da			Yes 5 (default)					
16	- Construction								
		Equi	ipment Name				nber Of iipment	Hours	Per Day
	Excavators Co					2.4	2		8
		Industrial Equipers/Backhoes Co		ite			1		8 8
17	Tractors/ Loade	JIS/ Ducknoes Co	Shiposhe				1		0
18 19 20 21 22		auling Truck (auling Truck F	Round Trip C			lefault) lefault)			
22		LDGV	LDGT	HDGV	LDDV	LDI	DT H	DDV	MC
	POVs	0	0	0	0	0	10	00.00	0
23 24 25 26 27	- Worker Trips Average W - Worker Trips	orker Round 7	ıre (%)		20 (default)				
	POVs	LDGV 50.00	LDGT 50.00	HDGV 0	LDDV 0	LDI 0		DDV 0	<u>MC</u>
28 29 30 31	6.3.3 Trenchi - Construction Graders Com	ng / Excavati Exhaust Emiss	ng Phase En	nission Fac	ctor(s)				0
		VOC		NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
	Emission Facto	ors 0.0676 uction Equipm		0.3314	0.5695	0.0147	0.0147	0.0061	132.89
	Other Constru	VOC		NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e
	Emission Facto	ors 0.0442		0.2021	0.3473	0.0068	0.0068	0.0039	122.60
	Rollers Comp			NO	GQ			CTT	GO
	Emission Facto	voc ors 0.0409		NO _x 0.2500	CO	PM 10	PM 2.5	CH ₄ 0.0036	CO ₂ e
		Dozers Comp		0.2300	0.3762	0.0122	0.0122	0.0036	67.123
	Aubber Intu	VOC	1	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e
	Emission Facto	ors 0.1671		1.0824	0.6620	0.0418	0.0418	0.0150	239.45
	Scrapers Com	posite VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81			
Tractors/Loaders/Ba	Tractors/Loaders/Backhoes Composite										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872			

1 2

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

						/			
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

5 6

8 9

12

6.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

- 7 $PM10_{FD} = (20 * ACRE * WD) / 2000$
 - PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 10 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 11 ACRE: Total acres (acres)
 - WD: Number of Total Work Days (days)

13	2000: Conversion Factor pounds to tons
14	-
15	- Construction Exhaust Emissions per Phase
16	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
17	
18	CEE _{POL} : Construction Exhaust Emissions (TONs)
19	NE: Number of Equipment
20	WD: Number of Total Work Days (days)
21	H: Hours Worked per Day (hours)
22	EF _{POL} : Emission Factor for Pollutant (lb/hour)
23	2000: Conversion Factor pounds to tons
24	
25	- Vehicle Exhaust Emissions per Phase
26	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
27	
28	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
29	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
30	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
31	HC: Average Hauling Truck Capacity (yd ³)
32	$(1 / HC)$: Conversion Factor cubic yards to trips $(1 \text{ trip} / HC \text{ yd}^3)$
33	HT: Average Hauling Truck Round Trip Commute (mile/trip)
34	
35	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
36	
37	V _{POL} : Vehicle Emissions (TONs)

- 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
- 39 0.002205: Conversion Factor grams to pounds
- 40 EF_{POL}: Emission Factor for Pollutant (grams/mile)
- 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%)
- 42 2000: Conversion Factor pounds to tons

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1	- Worker Trips Emissions per Phase		
2	$VMT_{WT} = WD * WT * 1.25 * NE$		
3			
4	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
5	WD: Number of Total Work Days (days)		
6	WT: Average Worker Round Trip Commute (mile)		
7	1.25: Conversion Factor Number of Construction Equipment to Num	mber of Works	
8	NE: Number of Construction Equipment		
9			
10	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
11	V Valiala Emissiona (TONa)		
12 13	V _{POL} : Vehicle Emissions (TONs)		
15 14	VMT _{VE} : Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds		
14 15	EF_{POL} : Emission Factor for Pollutant (grams/mile)		
15 16	VM: Worker Trips On Road Vehicle Mixture (%)		
10	2000: Conversion Factor pounds to tons		
18	2000. Conversion ractor pounds to tons		
19	6.4 Building Construction Phase		
20	0.4 Dunung Constituction I hase		
20	6.4.1 Building Construction Phase Timeline Assumptions		
21	0.4.1 Dunung Construction I hase Timenne Assumptions		
22	- Phase Start Date		
24	Start Month: 1		
25	Start Quarter: 1		
26	Start Year: 2025		
27			
28	- Phase Duration		
29	Number of Month: 12		
30	Number of Days: 0		
31			
32	6.4.2 Building Construction Phase Assumptions		
33			
34	- General Building Construction Information		
35	Building Category: Office or Industrial		
36	Area of Building (ft^2): 1582315		
37	Height of Building (ft): 25		
38	Number of Units: N/A		
39			
40	- Building Construction Default Settings		
41	Default Settings Used: Yes		
42 43	Average Day(s) worked per week: 5 (default)		
43 44	- Construction Exhaust (default)		
	Equipment Name	Number Of	Hours Per Day
	Equipment Func	Equipment	Hours i er Day
	Cranes Composite	1	7
	Forklifts Composite	3	8
	Generator Sets Composite	1	8
	Tractors/Loaders/Backhoes Composite	3	7
	Welders Composite	1	8
45			
46	- Vehicle Exhaust		

Average Hauling Truck Round Trip Commute (mile): 47 20 (default)

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	LDC	GV L	DGT	HDGV	LDDV	LDI	DT]	HDDV	MC
POVs	0		0	0	0	0		100.00	0
	Trips ge Worker Trips Vehic		-	e (mile):	20 (default))			
WUIKCI	LDC		DGT	HDGV	LDDV	LDI		HDDV	MC
POVs	50.0		50.00	0	0	0		0	0
	Frips ge Vendor Frips Vehic			e (mile):	40 (default))			
venuor			DGT	HDGV	LDDV	LDI	т	HDDV	MC
POVs	0		0	0	0	0		100.00	0
(13 Bui	lding Con	struction 1	Dhaca Emi	ccion Foot	or(c)				
	ction Exhau Composite	st Emission	n Factors (l	b/hour) (de NOx	efault) CO	PM 10	PM 2.5	CH4	CO ₂₆
Emission	Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.7
	Composite		0.0015	0.1222	0.5757	0.0115	0.0115	0.0001	120.7
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂
Emission	Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.44
Generate	or Sets Com	nposite			-				
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂
Emission		0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.05
Tractors	/Loaders/Ba	1		1	T		1		
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e
Emission		0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.87
*** * *									
Welders	Composite	Voq	60	NO	<u> </u>	DN 10	D) (2 5	CH	00
		VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH4	
Welders Emission		VOC 0.0214	SO _x 0.0003	NO x 0.1373	CO 0.1745	PM 10 0.0051	PM 2.5 0.0051	CH 4 0.0019	
Emission	Factors	0.0214	0.0003	0.1373		0.0051			
Emission Vehicle I	Factors Exhaust & V VOC	0.0214 Worker Tri SO _x	0.0003 ps Emissio NO _x	0.1373 n Factors (CO	0.1745 grams/mile PM 10	0.0051 PM 2.5		0.0019	25.65 CO ₂ e
Emission Vehicle I LDGV	Factors Exhaust & V VOC 000.197	0.0214 Worker Tri SO _x 000.002	0.0003 ps Emissio NO _x 0000.094	0.1373 n Factors (CO 003.149	0.1745 grams/mile PM 10 000.003	0.0051 PM 2.5 000.003	0.0051	0.0019 NH ₃ 000.024	25.650 CO ₂ e 00306.50
Emission Vehicle I LDGV LDGT	Factors Exhaust & V 000.197 000.208	0.0214 Worker Tri SO _x 000.002 000.003	0.0003 ps Emissio NO _x 000.094 000.168	0.1373 n Factors (CO 003.149 003.545	0.1745 grams/mile PM 10 000.003 000.005	0.0051 PM 2.5 000.003 000.004	0.0051	0.0019 NH ₃ 000.024 000.026	25.650 CO ₂ e 00306.50 00398.33
Emission Vehicle I LDGV LDGT HDGV	Factors Exhaust & V 000.197 000.208 000.890	0.0214 Worker Tri SO _x 000.002	0.0003 ps Emissio NO _x 000.094 000.168 000.817	0.1373 n Factors (CO 003.149 003.545 013.497	0.1745 grams/mile PM 10 000.003 000.005 000.022	0.0051 PM 2.5 000.003 000.004 000.020	0.0051	0.0019 NH ₃ 000.024 000.026 000.051	25.650 CO2e 00306.50 00398.33 00913.82
Emission Vehicle I LDGV LDGT HDGV LDDV	Factors Exhaust & V 000.197 000.208 000.890 000.059	0.0214 Worker Tri SO _x 000.002 000.003 000.006 000.001	0.0003 ps Emissio NO_x 000.094 000.168 000.817 000.080	0.1373 n Factors (003.149 003.545 013.497 003.473	0.1745 grams/mile PM 10 000.003 000.005 000.022 000.003	0.0051 PM 2.5 000.003 000.004 000.020 000.002	0.0051	0.0019 NH ₃ 000.024 000.026 000.051 000.008	00306.50 00398.33 00913.82 00311.24
Emission Vehicle I LDGV LDGT HDGV	Factors Exhaust & V 000.197 000.208 000.890	0.0214 Worker Tri SO _x 000.002 000.003 000.006	0.0003 ps Emissio NO _x 000.094 000.168 000.817	0.1373 n Factors (CO 003.149 003.545 013.497	0.1745 grams/mile PM 10 000.003 000.005 000.022	0.0051 PM 2.5 000.003 000.004 000.020	0.0051	0.0019 NH ₃ 000.024 000.026 000.051	25.65 CO2e 00306.5 00398.3 00913.8

18

HDDV

MC

19 6.4.4 Building Construction Phase Formula(s)

000.004

000.003

002.293

000.620

001.540

012.221

000.042

000.023

000.038

000.020

000.032

000.054

01238.796

00389.005

- 20
- 21 Construction Exhaust Emissions per Phase
- 22 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

000.101

002.758

- 23
- 24 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 25 NE: Number of Equipment

1	WD: Number of Total Work Days (days)
2	H: Hours Worked per Day (hours)
3	EF _{POL} : Emission Factor for Pollutant (lb/hour)
4	2000: Conversion Factor pounds to tons
5	
6	- Vehicle Exhaust Emissions per Phase
7	$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$
8	
9	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
10	BA: Area of Building (ft ²)
11	BH: Height of Building (ft)
12	$(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$
13	HT: Average Hauling Truck Round Trip Commute (mile/trip)
14	
15	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
16	
17	V _{POL} : Vehicle Emissions (TONs)
18	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
19	0.002205: Conversion Factor grams to pounds
20	EF _{POL} : Emission Factor for Pollutant (grams/mile)
21	VM: Worker Trips On Road Vehicle Mixture (%)
22	2000: Conversion Factor pounds to tons
23	
24	- Worker Trips Emissions per Phase
25	$VMT_{WT} = WD * WT * 1.25 * NE$
26	
27	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
28	WD: Number of Total Work Days (days)
29	WT: Average Worker Round Trip Commute (mile)
30	1.25: Conversion Factor Number of Construction Equipment to Number of Works
31	NE: Number of Construction Equipment
32	The Transfer of Construction Equipment
33	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
34	$FOE = (FM W_1 \otimes OOL DOC DOC DOC M_1 \otimes DOC \mathsf$
35	V _{POL} : Vehicle Emissions (TONs)
36	V_{POL} : Vorker Trips Vehicle Miles Travel (miles)
37	0.002205: Conversion Factor grams to pounds
38	EF_{POL} : Emission Factor for Pollutant (grams/mile)
39	VM: Worker Trips On Road Vehicle Mixture (%)
40	2000: Conversion Factor pounds to tons
41	2000. Conversion ractor pounds to tons
42	- Vender Trips Emissions per Phase
43	$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
44	$V[M1]_{1} = DA DII (0.567 1000) III$
45	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
46	BA: Area of Building (ft^2)
40 47	BH: Height of Building (ft)
48	(0.38×1000) : Conversion Factor ft ³ to trips (0.38 trip $\times 1000$ ft ³)
48 49	HT: Average Hauling Truck Round Trip Commute (mile/trip)
49 50	HI: Average Hauning Truck Round Trip Commute (inne/inp)
	V = (V M T * 0.000005 * EE * V M) / 2000
51 52	$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$
52	V Valiala Erricaina (TONa)
53 54	V _{POL} : Vehicle Emissions (TONs)
54	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
55	0.002205: Conversion Factor grams to pounds

1	NOVEMBE	R 2023								
2	EF _{POL} : VM: V	Emission I Worker Trip	s On Road	Vehicle Mix						
3 4	2000:	Conversion	Factor pou	nds to tons						
5 6	6.5 Archi	itectural C	Coatings P	hase						
7 8	6.5.1 Arc	hitectural	Coatings	Phase Tin	neline Ass	umptions				
9	- Phase Sta									
10			7							
11 12	Start Start	Quarter:	2025							
12	Start		2023							
13	- Phase Du	ration								
15		er of Mont	h: 6							
16	Numb	er of Days:	0							
17										
18 19		hitectural	0		-					
20		Architectur								
21 22		ng Categor Square Foo		on-Residen	tial					
22		square roo er of Units:	-	1382515 /A						
23 24	Ituino	ci oi Ointsa	, 11	/ / 1						
25	- Architect	tural Coatii	ngs Default	Settings						
26		lt Settings U		-	les					
27	Avera	ge Day(s) w	orked per	week: 5	(default)					
28					(ucrauit)					
	Wardson	F! ~			(ueraunt)					
29	- Worker Avera	-	Round Tri		. ,	20 (default)			
		Frips ge Worker	Round Tri		. ,	20 (default)			
29 30	Avera	ge Worker <u>Frips Vehic</u>	le Mixture	p Commut	e (mile):					
29 30 31	Avera - Worker 2	ge Worker Frips Vehic LDC	le Mixture SV L	p Commut (%) .DGT	e (mile): HDGV	LDDV	LDD	T	HDDV	МС
29 30 31 32	Avera	ge Worker <u>Frips Vehic</u>	le Mixture SV L	p Commut	e (mile):			T	HDDV 0	MC 0
29 30 31 32 33	Avera - Worker 7 POVs	ge Worker <u> Frips Vehic</u> <u> LDC</u> 50.0	le Mixture SV L 00 5	p Commut (%) .DGT 50.00	e (mile): HDGV 0	LDDV 0	LDD	T		
29 30 31 32 33 34	Avera - Worker 7 POVs	ge Worker Frips Vehic LDC	le Mixture SV L 00 5	p Commut (%) .DGT 50.00	e (mile): HDGV 0	LDDV 0	LDD	T		
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc	ge Worker <u>Frips Vehic</u> <u>LD(</u> 50.(hitectural	le Mixture V L 00 5 Coatings	p Commut (%) DGT 50.00 Phase Em	e (mile): HDGV 0 ission Fac	LDDV 0	LDD	T		
29 30 31 32 33 34	Avera - Worker 7 POVs 6.5.3 Arc	ge Worker <u>Frips Vehic</u> <u>LDC</u> 50.(hitectural <u>Frips Emiss</u>	le Mixture V L 00 5 Coatings sion Factor	p Commut (%) DGT 50.00 Phase Em s (grams/m	e (mile): HDGV 0 ission Fac iile)	LDDV 0 tor(s)	LDD 0		0	0
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7	ge Worker Frips Vehic LDC 50.0 chitectural Frips Emiss VOC	le Mixture V L 00 5 Coatings sion Factor SO _x	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x	e (mile): HDGV 0 ission Fac iile) CO	LDDV 0	LDD	T Pb		0 CO 2 e
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc	ge Worker <u>Frips Vehic</u> <u>LDC</u> 50.(hitectural <u>Frips Emiss</u>	le Mixture V L 00 5 Coatings sion Factor	p Commut (%) DGT 50.00 Phase Em s (grams/m	e (mile): HDGV 0 ission Fac iile)	LDDV 0 tor(s) PM 10 000.003	LDD 0 PM 2.5		0 NH ₃	0 CO ₂ e 00306.502
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV	ge Worker Frips Vehic 50.(hitectural Frips Emiss VOC 000.197	Ie Mixture SV L 00 5 Coatings sion Factor SO _x 000.002	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094	e (mile): HDGV 0 ission Fac iile) CO 003.149	LDDV 0 tor(s) PM 10	LDD 0 PM 2.5 000.003		0 NH ₃ 000.024	0 CO 2 e
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGT	ge Worker Frips Vehic 50.(hitectural Frips Emiss VOC 000.197 000.208	Ie Mixture SV L 00 5 Coatings sion Factor SOx 000.002 000.003 000.003	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545	LDDV 0 tor(s) PM 10 000.003 000.005	LDD 0 9 000.003 000.004		0 NH ₃ 000.024 000.026	0 CO₂e 00306.502 00398.336
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT	ge Worker Frips Vehic LDC 50.0 Fhitectural Frips Emiss VOC 000.197 000.208 000.890 000.059 000.064	Ie Mixture V L 00 5 Coatings sion Factor SO _x 000.002 000.003 000.003 000.006 000.001 000.001	p Commut (%) JDGT 50.00 Phase Em s (grams/m NOx 000.094 000.168 000.817 000.080 000.119	e (mile): HDGV 0 ission Fac ile) 003.149 003.545 013.497 003.473 002.357	LDDV 0 tor(s) PM 10 000.003 000.005 000.022 000.003 000.003	LDD 0		0 NH ₃ 000.024 000.026 000.051 000.008 000.009	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998
29 30 31 32 33 34 35	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGT HDGV LDDT HDDV	ge Worker	le Mixture V L 00 5 Coatings sion Factor SO₂ 000.002 000.003 000.006 000.001 000.001 000.001 000.004	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293	e (mile): HDGV 0 ission Fac iile) 003.149 003.545 013.497 003.473 002.357 001.540	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT	ge Worker Frips Vehic LDC 50.0 Fhitectural Frips Emiss VOC 000.197 000.208 000.890 000.059 000.064	Ie Mixture V L 00 5 Coatings sion Factor SO _x 000.002 000.003 000.003 000.006 000.001 000.001	p Commut (%) JDGT 50.00 Phase Em s (grams/m NOx 000.094 000.168 000.817 000.080 000.119	e (mile): HDGV 0 ission Fac ile) 003.149 003.545 013.497 003.473 002.357	LDDV 0 tor(s) PM 10 000.003 000.005 000.022 000.003 000.003	LDD 0		0 NH ₃ 000.024 000.026 000.051 000.008 000.009	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998
29 30 31 32 33 34 35 36	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDT HDDV MC	ge Worker	SV L 00 5 Coatings sion Factor SOx 000.002 000.003 000.003 000.006 000.001 000.001 000.003 000.004	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293 000.620	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545 013.497 003.473 002.357 001.540 012.221	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36 37 38	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDT HDDV MC	ge Worker	SV L 00 5 Coatings sion Factor SOx 000.002 000.003 000.003 000.006 000.001 000.001 000.003 000.004	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293 000.620	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545 013.497 003.473 002.357 001.540 012.221	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36 37 38 39	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT HDDV MC 6.5.4 Arc	ge Worker	Ie Mixture V L 00 5 Coatings sion Factor SOx 000.002 000.002 000.003 000.006 000.001 000.001 000.003 000.003 000.004 000.003 Coatings Coatings	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293 000.620 Phase For	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545 013.497 003.473 002.357 001.540 012.221	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36 37 38 39 40	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT HDDV MC 6.5.4 Arc - Worker 7	ge Worker Frips Vehic 50.0 Fhitectural Frips Emiss VOC 000.197 000.208 000.890 000.059 000.064 000.101 002.758 Fhitectural Frips Emiss	Ie Mixture V L 00 5 Coatings sion Factor SOx 000.002 000.003 000.003 000.001 000.001 0000.003 000.004 000.003 Coatings sions per Pl	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293 000.620 Phase For	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545 013.497 003.473 002.357 001.540 012.221	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36 37 38 39	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT HDDV MC 6.5.4 Arc - Worker 7	ge Worker	Ie Mixture V L 00 5 Coatings sion Factor SOx 000.002 000.003 000.003 000.001 000.001 0000.003 000.004 000.003 Coatings sions per Pl	p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.094 000.168 000.817 000.080 000.119 002.293 000.620 Phase For	e (mile): HDGV 0 ission Fac iile) CO 003.149 003.545 013.497 003.473 002.357 001.540 012.221	LDDV 0 tor(s) PM 10 000.003 000.005 000.003 000.003 000.003 000.003 000.003 000.0042	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796
29 30 31 32 33 34 35 36 37 38 39 40 41	Avera - Worker 7 POVs 6.5.3 Arc - Worker 7 LDGV LDGV LDGT HDGV LDDV LDDT HDDV MC 6.5.4 Arc - Worker 7 VMTwT = 0 VMTw	ge Worker Frips Vehic 50.0 Fhitectural Frips Emiss VOC 000.197 000.208 000.890 000.059 000.064 000.101 002.758 Fhitectural Frips Emiss	Ie Mixture V L 00 5 Coatings sion Factor SOx 000.002 000.003 000.006 000.001 000.001 000.003 000.004 000.003 Coatings sions per Pl A) / 800 Trips Vehic	p Commut (%) JDGT 50.00 Phase Em s (grams/m NOx 000.094 000.094 000.080 000.119 002.293 000.620 Phase For hase Set Miles Training the structure of the structure	e (mile): HDGV 0 ission Fac iile) 003.149 003.545 013.497 003.545 013.497 003.473 002.357 001.540 012.221 rmula(s) avel (miles)	LDDV 0 tor(s) PM 10 000.003 000.005 000.022 000.003 000.003 000.042 000.023	LDD 0 PM 2.5 000.003 000.004 000.002 000.003 000.003 000.003		0 NH ₃ 000.024 000.025 000.051 000.008 000.009 000.032	0 CO2e 00306.502 00398.336 00913.820 00311.249 00361.998 01238.796

WT: Average Worker Round Trip Commute (mile)		
PA: Paint Area (ft^2)	 1 \	
800: Conversion Factor square feet to man days ($1 \text{ ft}^2 / 1 \text{ mat}^2$	an * 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		
I		
- 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	ed 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		
Start Year: 2025		
- Phase Duration		
Number of Month: 12		
Number of Days: 0		
Number of Days.		
6.6.2 Paving Phase Assumptions		
i u ing i nuse instanipitons		
- General Paving Information		
Paving Area (ft²): 2651744		
- Paving Default Settings		
Default Settings Used: Yes		
Average Day(s) worked per week: 5 (default)		
- Construction Exhaust (default)		
Equipment Name	Number Of	Hours Per Day
	Equipment	
	1	8
Pavers Composite		
Pavers Composite Paving Equipment Composite Rollers Composite	2 2	8 6

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC				
POVs	0	0	0	0	0	100.00	0				
- Worker Tr	ins										
- Worker Trips											
	-	d Trin Comm	uto (milo).	20 (defeult)							
	Worker Roun	d Trip Comm	ute (mile):	20 (default)							
Average	Worker Roun	-	ute (mile):	20 (default)							
Average	-	-	ute (mile):	20 (default)							
Average	Worker Roun	-	ute (mile): HDGV	20 (default)	LDDT	HDDV	MC				
Average	Worker Roun	xture (%)			LDDT 0	HDDV 0	MC 0				
Average	Worker Roun	xture (%)			_	HDDV 0	M (

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

Graders Composite

Graders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rollers Composite								
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0409	0.0007	0.2500	0.3762	0.0122	0.0122	0.0036	67.123
Rubber Tired Dozer	s Composit	te						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite	!							
	VOC	SOx	NOx	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/Ba	ackhoes Co	mposite						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

11 12

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

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
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

13

14 6.6.4 Paving Phase Formula(s)

- 15
- 16 Construction Exhaust Emissions per Phase
- 17 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18
- 19 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 20 NE: Number of Equipment
- 21 WD: Number of Total Work Days (days)
- 22 H: Hours Worked per Day (hours)
- 23 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 24 2000: Conversion Factor pounds to tons

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	Vehicle Exhaust Emissions per Phase MT _{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 ₁	$P_{OL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
	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
V	$MT_{WT} = WD * WT * 1.25 * NE$
	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 Work
	NE: Number of Construction Equipment
V	$P_{OL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
	V Valiala Encirciana (TONa)
	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
	2000. Conversion Factor pounds to tons
- (Off-Gassing Emissions per Phase
	$OC_P = (2.62 * PA) / 43560$
	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
/•	r General Information & Enternic Assumptions
	Activity Location

52 - Activity Location53 County: Taylor

54 **Regulatory Area(s):** NOT IN A REGULATORY AREA

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- Activity Title: Dyess WGF 1

2		-
3	- Activity Descript	ion:
4	See Section 2.1	.5
5		
6	- Activity Start Da	te
7	Start Month:	1
8	Start Month:	2025
9		
10	- Activity End Dat	e
11	Indefinite:	False
12	End Month:	12
13	End Month:	2025
14		
15	- Activity Emission	ns:
	Pollutant	Total Er
	VOC	2

Pollutant	Total Emissions (TONs)				
VOC	2.950959				
SO _x	0.035705				
NO _x	11.062384				
СО	13.195307				
PM 10	262.981963				

7.1.1 Site Grading Phase Timeline Assumptions

Pollutant	Total Emissions (TONs)
PM 2.5	0.438996
Pb	0.000000
NH ₃	0.006508
CO ₂ e	3554.8

18 19 20

16

17

7.1 Site Grading Phase

20			
21	- Phase Start Date		
22	Start Month: 1		
23	Start Quarter: 1		
24	Start Year: 2025		
25			
26	- Phase Duration		
27	Number of Month: 12		
28	Number of Days: 0		
29			
30	7.1.2 Site Grading Phase Assump	otions	
31			
32	- General Site Grading Information		
33	Area of Site to be Graded (ft ²):		2178000
34	Amount of Material to be Hauled	d On-Site (yd ³):	217
35	Amount of Material to be Haule	d Off-Site (yd ³):	217
36			
37	- Site Grading Default Settings		
38	Default Settings Used:	Yes	
39	Average Day(s) worked per week	x: 5 (default)	
40			

40 41 - 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

1

2

3

4 5

6 7

8

9 10

11 12

13 14

- Average Hauling Truck Capacity (yd³):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 (%)

,, or more in the	pb veinere ivin						
	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

Graders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozen	s Composit	te						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite	:							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	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	SOx	NOx	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

15 16

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

	VOC	SO _x	NOx	CO	PM 10	PM 2.5	Pb	NH ₃	CO ₂ e
LDCU			· - A		-		10	. 3	_
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

17

18 **7.1.4 Site Grading Phase Formula(s)**

19

20 - Fugitive Dust Emissions per Phase

21 PM10_{FD} = (20 * ACRE * WD) / 2000 22

- 23 PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 24 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 25 ACRE: Total acres (acres)
- 26 WD: Number of Total Work Days (days)
- 27 2000: Conversion Factor pounds to tons

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1	- Construction Exhaust Emissions per Phase
2	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
3	
4	CEE _{POL} : Construction Exhaust Emissions (TONs)
5	NE: Number of Equipment
6	WD: Number of Total Work Days (days)
7	H: Hours Worked per Day (hours)
8	EF _{POL} : Emission Factor for Pollutant (lb/hour)
9	2000: Conversion Factor pounds to tons
10	
11	- Vehicle Exhaust Emissions per Phase
12	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
13	
14	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
15	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd^3)
16	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
17 18	HC: Average Hauling Truck Capacity (yd ³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
18 19	HT: Average Hauling Truck Round Trip Commute (mile/trip)
20	111. Average flauling fluck Round flip Commute (mile/ulp)
20	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
22	$V_{\rm FOL} = (V_{\rm FOL} + V_{\rm FOL} + V_{$
23	V _{POL} : Vehicle Emissions (TONs)
24	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
25	0.002205: Conversion Factor grams to pounds
26	EF _{POL} : Emission Factor for Pollutant (grams/mile)
27	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
28	2000: Conversion Factor pounds to tons
29	
30	- Worker Trips Emissions per Phase
31	$VMT_{WT} = WD * WT * 1.25 * NE$
32 33	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
33 34	WD: Number of Total Work Days (days)
35	WD: Number of Total Work Days (days) WT: Average Worker Round Trip Commute (mile)
36	1.25: Conversion Factor Number of Construction Equipment to Number of Works
37	NE: Number of Construction Equipment
38	
39	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
40	
41	V _{POL} : Vehicle Emissions (TONs)
42	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
43	0.002205: Conversion Factor grams to pounds
44	EF _{POL} : Emission Factor for Pollutant (grams/mile)
45	VM: Worker Trips On Road Vehicle Mixture (%)
46	2000: Conversion Factor pounds to tons
47	
48	7.2 Trenching/Excavating Phase
49	
50	7.2.1 Trenching / Excavating Phase Timeline Assumptions
51 52	Dhaga Start Data
52 53	- Phase Start Date Start Month: 1
55 54	Start Month: 1 Start Quarter: 1
51	Surre Kanneere .

132.89

122.60

239.45

CO₂e

262.81

C4 4 X 7	r: 2025							
Start Yea	r: 2023							
Dhaga Dunad	•							
Phase Durat Number o								
Number of								
Tumber	n Days. 0							
.2.2 Trench	ning / Excavatin	g Phase Ass	sumptions					
General Tre	nching/Excavatir	g Informatio	n					
Area of S	ite to be Trenche	d/Excavated	(ft ²):	21300				
	of Material to be 1			2.1				
Amount of	of Material to be	Hauled Off-S	Site (yd ³):	2.1				
Frenching D	efault Settings							
	ettings Used:	Ŷ	'es					
	Day(s) worked pe		(default)					
C	• • • •		(
Construction	n Exhaust (defaul	,					TT	D. D.
	Equip	oment Name				nber Of ipment	Hours	Per Day
Excavators C						2		8
	l Industrial Equip		te			1		8
Fractors/Loa	ders/Backhoes Co	mposite				1		8
Average l	aust Hauling Truck Ca	apacity (yd ³):			lefault)	1		
Average l Average l	aust Hauling Truck Ca Hauling Truck Ro	apacity (yd ³): ound Trip Co			lefault) lefault)	1		0
Average l Average l	aust Hauling Truck Ca	apacity (yd ³): ound Trip Co				-	IDDV	MC
Average l Average l Vehicle Exh	aust Hauling Truck Ca Hauling Truck Ro aust Vehicle Mixt	apacity (yd ³): ound Trip Co cure (%)	ommute (m	ile): 20 (d	lefault)	DT H	HDDV 00.00	
Average I Average I Vehicle Exhi POVs Worker Trij Average V	aust Hauling Truck Ca Hauling Truck Ro aust Vehicle Mixt LDGV 0 0 worker Round T ps Vehicle Mixtur	apacity (yd ³): ound Trip Co cure (%) LDGT 0 rip Commuto re (%)	ommute (m HDGV 0 e (mile):	ile): 20 (c	lefault)	DT H	00.00	MC 0
Average I Average I chicle Exha DVs orker Trij Average V orker Trij	aust Hauling Truck Ca Hauling Truck Ro aust Vehicle Mixt LDGV 0 95 Worker Round T ps Vehicle Mixtur LDGV	apacity (yd ³): ound Trip Co ure (%) LDGT 0 rip Commute re (%) LDGT	HDGV 0 e (mile): HDGV	ile): 20 (default) LDDV 0 20 (default) LDDV	lefault) LDI 0 LDI	DT H	00.00	<u>МС</u> 0 МС
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 7.2.3 Trench Construction	aust Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt LDGV 0 Worker Round T ps Vehicle Mixtur LDGV 50.00 ning / Excavatin n Exhaust Emissi	apacity (yd ³): ound Trip Co cure (%) LDGT 0 rip Commute re (%) LDGT 50.00 sg Phase Em	HDGV 0 e (mile): HDGV 0 ission Fac	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s)	lefault)	DT H	00.00	MC 0
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 2.3 Trench Construction	aust Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt LDGV 0 Worker Round T ps Vehicle Mixtur LDGV 50.00 ning / Excavatin n Exhaust Emissi	apacity (yd ³): ound Trip Co cure (%) LDGT 0 rip Commute re (%) LDGT 50.00 sg Phase Em	HDGV 0 e (mile): HDGV 0 ission Fac	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s)	lefault) LDI 0 LDI	DT H	00.00	<u>МС</u> 0 <u>МС</u> 0
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs .2.3 Trench Construction Graders Con	aust Hauling Truck Ca Hauling Truck Ca Hauling Truck Ro aust Vehicle Mixt LDGV 0 Pos Worker Round T pos Vehicle Mixtun LDGV 50.00 ning / Excavatin n Exhaust Emissi nposite VOC stors 0.0676	apacity (yd ³): bund Trip Co ure (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014	mmute (m HDGV 0 e (mile): HDGV 0 hission Factorial b/hour) (de NO _x 0.3314	ile): 20 (c LDDV 0 20 (default) 20 (default) Ctor(s) fault)	lefault)	DT H 1 DT H	00.00 IDDV 0	MC 0 MC 0
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 2.3 Trench Construction Graders Con	aust Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt LDGV 0 0 worker Round T ps Vehicle Mixtur LDGV 50.00 ning / Excavatin n Exhaust Emissi nposite VOC stors 0.0676 ruction Equipme	apacity (yd ³): ound Trip Co ure (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014 nt Composite	mmute (m HDGV 0 e (mile): HDGV 0 sission Fac b/hour) (de NO _x 0.3314	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695	lefault)	DT H DT H DT H PM 2.5 0.0147	00.00 HDDV 0 CH4 0.0061	MC 0 MC 0 0
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs .2.3 Trench Construction Graders Con Emission Fac Other Const	aust Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt DGV 0 0 worker Round T os Vehicle Mixtur LDGV 50.00 hing / Excavatin n Exhaust Emissi nposite VOC etors 0.0676 ruction Equipme	apacity (yd ³): ound Trip Co ture (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014 nt Composite SO _x	mmute (m HDGV 0 e (mile): HDGV 0 tission Fac b/hour) (de NOx 0.3314 e NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695 CO	lefault)	DT H 1 1 0T H 0T <td>00.00 HDDV 0 CH4 0.0061 CH4</td> <td>МС 0 МС 0 СО2е 132.89</td>	00.00 HDDV 0 CH4 0.0061 CH4	МС 0 МС 0 СО2е 132.89
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 2.3 Trench Construction Graders Con Emission Fac Other Const Emission Fac	aust Hauling Truck Ca Hauling Truck Ca Aust Vehicle Mixt LDGV 0 S Worker Round T S S Vehicle Mixtur LDGV 50.00 ning / Excavatin n Exhaust Emissi nposite VOC ctors 0.0676 ruction Equipme VOC ctors 0.0442	apacity (yd ³): ound Trip Co ture (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014 nt Composite SO _x 0.0012	mmute (m HDGV 0 e (mile): HDGV 0 sission Factorial b/hour) (de NO _x 0.3314	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695	lefault)	DT H DT H DT H PM 2.5 0.0147	00.00 HDDV 0 CH4 0.0061	MC 0 MC 0 0
Average I Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 7.2.3 Trench Construction Graders Con Emission Fac Other Const	aust Hauling Truck Ca Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt LDGV 0 S Worker Round T S Vehicle Mixtun LDGV 50.00 ning / Excavatin n Exhaust Emissi nposite VOC tors 0.0676 ruction Equipme VOC tors 0.0442 d Dozers Compo	apacity (yd ³): ound Trip Co are (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014 nt Composite SO _x 0.0012 site	HDGV 0 0 0 e (mile): 1 HDGV 0 o 0 bission Fac 0 b/hour) (de NOx 0.3314 0 e NOx 0.2021 0	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695 CO 0.3473	lefault)	PT H 0T H 0T <td>00.00 IDDV 0 CH4 0.0061 CH4 0.0039</td> <td>МС 0 МС 0 0 СО2е 132.89</td>	00.00 IDDV 0 CH4 0.0061 CH4 0.0039	МС 0 МС 0 0 СО2е 132.89
Average I Vehicle Exha POVs Worker Trij Average V Worker Trij POVs 7.2.3 Trench Construction Graders Cor Emission Fac Other Const Emission Fac	aust Hauling Truck Ca Hauling Truck Ra aust Vehicle Mixt DGV 0 0 worker Round T os Vehicle Mixtur LDGV 50.00 hing / Excavatin n Exhaust Emissi nposite VOC etors 0.0676 ruction Equipme VOC etors 0.0442 d Dozers Compo	apacity (yd ³): ound Trip Co ture (%) LDGT 0 rip Commute re (%) LDGT 50.00 ag Phase Em on Factors (ll SO _x 0.0014 nt Composite SO _x 0.0012	mmute (m HDGV 0 e (mile): HDGV 0 tission Fac b/hour) (de NOx 0.3314 e NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695 CO	lefault)	DT H 1 1 0T H 0T <td>00.00 HDDV 0 CH4 0.0061 CH4</td> <td>МС 0 МС 0 СО2е 132.89</td>	00.00 HDDV 0 CH4 0.0061 CH4	МС 0 МС 0 СО2е 132.89

Scrapers Composite

Emission Factors

VOC

0.1495

SO_x

0.0026

NO_x

0.8387

СО

0.7186

PM 10

0.0334

PM 2.5

0.0334

CH₄

0.0134

Tractors/Loaders/Backhoes Composite										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e		
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872		

1 2

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂ e
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

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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)
- 10 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 11 ACRE: Total acres (acres)
 - WD: Number of Total Work Days (days)
 - 2000: Conversion Factor pounds to tons

15 - Construction Exhaust Emissions per Phase

- 16 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
 - 2000: Conversion Factor pounds to tons
- 25 Vehicle Exhaust Emissions per Phase
- 26 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
- 27 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 29 HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) 30 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) 31 HC: Average Hauling Truck Capacity (yd³) 32 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) 33 HT: Average Hauling Truck Round Trip Commute (mile/trip) 34 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 35 36 VPOL: Vehicle Emissions (TONs) 37 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 39 0.002205: Conversion Factor grams to pounds 40 EF_{POL}: Emission Factor for Pollutant (grams/mile) 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%) 42 2000: Conversion Factor pounds to tons
- 43

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1 2	- Worker Trips Emissions per Phase VMT _{WT} = WD * WT * 1.25 * NE		
3			
4	VMT _{wT} : Worker Trips Vehicle Miles Travel (miles)		
5	WD: Number of Total Work Days (days)		
6	WT: Average Worker Round Trip Commute (mile)		
7	1.25: Conversion Factor Number of Construction Equipment to Nu	mber of Works	
8	NE: Number of Construction Equipment	moet of works	
9	ME. Number of construction Equipment		
10	V _{POL} = (VMT _{WT} * 0.002205 * EF _{POL} * VM) / 2000		
11	$V_{\rm FOL} = (V_{\rm IVII} W_{\rm I} - 0.002203 - EI_{\rm FOL} - V_{\rm IVI}) / 2000$		
12	V _{POL} : Vehicle Emissions (TONs)		
13	VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)		
14	0.002205: Conversion Factor grams to pounds		
15	EF_{POL} : Emission Factor for Pollutant (grams/mile)		
16	VM: Worker Trips On Road Vehicle Mixture (%)		
17	2000: Conversion Factor pounds to tons		
18	2000. Conversion ractor pounds to tons		
19	7.3 Building Construction Phase		
20	7.5 Dunung Construction Thase		
20	7.3.1 Building Construction Phase Timeline Assumptions		
21	7.5.1 Dunding Construction Phase Timenne Assumptions		
22	- Phase Start Date		
23 24	Start Month: 1		
24 25	Start Quarter: 1		
25 26	Start Year: 2025		
20 27			
28	- Phase Duration		
29	Number of Month: 12		
30	Number of Days: 0		
31			
32	7.3.2 Building Construction Phase Assumptions		
33			
34	- General Building Construction Information		
35	Building Category: Office or Industrial		
36	Area of Building (ft ²): 81620		
37	Height of Building (ft): 25		
38	Number of Units: N/A		
39			
40	- Building Construction Default Settings		
41	Default Settings Used: Yes		
42	Average Day(s) worked per week: 5 (default)		
43 44	Construction Fachaust (Johan 14)		
44	- Construction Exhaust (default) Equipment Name	Number Of	Hours Per Day
	Equipment Ivame	Equipment	Ilouis i ei Day
	Cranes Composite	1	6
	Forklifts Composite	2	6
	Generator Sets Composite	1	8
	Tractors/Loaders/Backhoes Composite	1	8
	Welders Composite	3	8
45			
46	- Vehicle Exhaust		

Average Hauling Truck Round Trip Commute (mile): 47 20 (default)

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	LDO	J Ve	DGT	HDGV	LDDV	LDI		HDDV	M
POVs	0		0	0	0	0	-	100.00	0
	T 1								
- Worker									
Avera	ge Worker	Round Tri	p Commut	e (mile):	20 (default)			
- Worker	Trips Vehic	ele Mixture	(%)						
	LDO		DGT	HDGV	LDDV	LDI	DT I	HDDV	Μ
POVs	50.0	00	50.00	0	0	0		0	0
- Vendor 7	Fring								
	ge Vendor	Round Tri	p Commute	e (mile):	40 (default)			
	0					, ,			
- Vendor 7	Frips Vehic				TODI				3.5
	LDO		DGT	HDGV	LDDV	LDI		HDDV	M
POVs	0		0	0	0	0		100.00	0
	tion Exhau	ist Emissio	n Factors (l	b/hour) (de	efault)				
Cranes C	Composite	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128
	Composite		0.0015	0.4222	0.3737	0.0143	0.0143	0.0001	120
TUIKIIIts	Composite	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	C
Emission	Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.
	or Sets Con		0.0000	0.0057	0.2117	0.0025	0.0025	0.0021	
		VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.
Tractors	/Loaders/B	ackhoes Co	omposite						
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	C
Emission		0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.
Welders	Composite	1		-		1	1		
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.
Vobials	Tubouct 9-1	Wonkon T-	na Emissia	n Footowa (anome/mile	`			
• venicie i	VOC	SO _x	NO _x	CO	grams/mile PM 10	PM 2.5	Pb	NH ₃	CC
LDGV	000.197	000.002	000.094	003.149	000.003	000.003	10	000.024	00306
LDGV	000.197	000.002	000.168	003.545	000.005	000.003		000.024	00300
	000.208	000.005	000.108	013.497	000.003	000.004		000.020	00393
HIXXV					$1 \sqrt{1} \sqrt{1} \sqrt{2}$	1 000.020	1	VVVVVVV	= いいフレ.
HDGV LDDV	000.059	000.001	000.080	003.473	000.003	000.002		000.008	00311

18

LDDT

HDDV

MC

19 **7.3.4 Building Construction Phase Formula(s)**

000.001

000.004

000.003

000.119

002.293

000.620

002.357

001.540

012.221

000.003

000.042

000.023

000.003

000.038

000.020

000.009

000.032

000.054

00361.998

01238.796

00389.005

20

21 - Construction Exhaust Emissions per Phase

22	$CEE_{POL} =$	(NE *	WD	* H	* EF _{POL})	/ 2000

000.064

000.101

002.758

- 23
- 24 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 25 NE: Number of Equipment

1	WD: Number of Total Work Days (days)
2	H: Hours Worked per Day (hours)
3	EF _{POL} : Emission Factor for Pollutant (lb/hour)
4	2000: Conversion Factor pounds to tons
5	
6	- Vehicle Exhaust Emissions per Phase
7	$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$
8	
9	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
10	BA: Area of Building (ft^2)
11	BH: Height of Building (ft)
12	$(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$
13	HT: Average Hauling Truck Round Trip Commute (mile/trip)
14	
15	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
16	
17	V _{POL} : Vehicle Emissions (TONs)
18	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
19	0.002205: Conversion Factor grams to pounds
20	EF _{POL} : Emission Factor for Pollutant (grams/mile)
21	VM: Worker Trips On Road Vehicle Mixture (%)
22	2000: Conversion Factor pounds to tons
23	F
24	- Worker Trips Emissions per Phase
25	$VMT_{WT} = WD * WT * 1.25 * NE$
26	
27	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
28	WD: Number of Total Work Days (days)
29	WT: Average Worker Round Trip Commute (mile)
30	1.25: Conversion Factor Number of Construction Equipment to Number of Works
31	NE: Number of Construction Equipment
32	
33	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
34	
35	V _{POL} : Vehicle Emissions (TONs)
36	VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)
37	0.002205: Conversion Factor grams to pounds
38	EF_{POL} : Emission Factor for Pollutant (grams/mile)
39	VM: Worker Trips On Road Vehicle Mixture (%)
40	2000: Conversion Factor pounds to tons
41	F
42	- Vender Trips Emissions per Phase
43	$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
44	
45	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
46	BA: Area of Building (ft^2)
47	BH: Height of Building (ft)
48	(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)
49	HT: Average Hauling Truck Round Trip Commute (mile/trip)
50	mit. Morage maning mack Round mp commute (mite/mp)
51	$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$
52	TOL CHILLY GOODEOS DEPOL THEY DOOD
53	V _{POL} : Vehicle Emissions (TONs)
55 54	VPOL. Vender Trips Vehicle Miles Travel (miles)
55	0.002205: Conversion Factor grams to pounds

EF _{POL} : VM: W 2000: (7.4 Archit 7.4.1 Arcl - Phase Sta Start M Start Q Start Y - Phase Dun Numbe Numbe 7.4.2 Arcl
7.4.1 Arcl - Phase Sta Start N Start Q Start Y - Phase Dur Numbe Numbe
7.4.1 Arcl - Phase Sta Start N Start Q Start Y - Phase Dur Numbe Numbe
Start M Start Q Start Y - Phase Dur Numbe Numbe
Start M Start Q Start Y - Phase Dur Numbe Numbe
Start Q Start Y - Phase Dur Numbe Numbe
Start Y - Phase Dun Numbe Numbe
Numbe Numbe
Numbe Numbe
Numbe
7.4.2 Arcl
7.4.2 Arci
- General A
Buildin
Total S
Numbe
Worlson T
- Worker T Averag
Averag
Averag - Worker T
Averag - Worker T POVs 7.4.3 Arcl - Worker T
Averag - Worker T POVs 7.4.3 Arcl - Worker T LDGV
Averag - Worker T POVs 7.4.3 Arcl - Worker T LDGV LDGV LDGT
Averag - Worker T POVs 7.4.3 Arcl - Worker T LDGV LDGV LDGT HDGV
Averag - Worker T POVs 7.4.3 Arcl - Worker T LDGV LDGV LDGT HDGV LDDV
Averag - Worker T POVs 7.4.3 Arcl - Worker T LDGV LDGV LDGT HDGV

44 1: Conversion Factor man days to trips (1 trip / 1 man * day)

	VT: Average Worker Round Trip Commute (mile)		
	A: Paint Area (ft ²)		
8	00: Conversion Factor square feet to man days ($1 \text{ ft}^2 / 1 \text{ man } * \text{ days}$	ay)	
	= (VMT _{WT} * 0.002205 * EF _{POL} * VM) / 2000		
v V	V _{POL} : Vehicle Emissions (TONs)		
	/MT _{wT} : Worker Trips Vehicle Miles Travel (miles)		
	.002205: Conversion Factor grams to pounds		
	EFPOL: Emission Factor for Pollutant (grams/mile)		
	M YOL: Worker Trips On Road Vehicle Mixture (%)		
	000: Conversion Factor pounds to tons		
	boo. Conversion ractor pounds to tons		
	Gassing Emissions per Phase		
	$A_{\rm AC} = (AB * 2.0 * 0.0116) / 2000.0$		
VOC	$A_{\rm L} = (I {\rm M} {\rm J}^2 2.0 0.0110) / 2000.0$		
	OC _{AC} : Architectural Coating VOC Emissions (TONs)		
	BA: Area of Building (ft ²)		
	.0: Conversion Factor total area to coated area (2.0 ft^2 coated area	/ total area)	
	.0116: Emission Factor (lb/ft ²)	() total alou)	
	000: Conversion Factor pounds to tons		
	····· ································		
7.5 I	Paving Phase		
7.5 I			
	Paving Phase Timeline Assumptions		
	U		
- Pha	se Start Date		
S	tart Month: 1		
S	tart Quarter: 1		
S	tart Year: 2025		
	se Duration		
	Sumber of Month: 12		
N	Sumber of Days: 0		
7.5.2	Paving Phase Assumptions		
	eral Paving Information		
P	Paving Area (ft²): 410911		
	ing Default Settings		
	Default Settings Used: Yes		
A	verage Day(s) worked per week: 5 (default)		
G			
- Con	struction Exhaust (default)	Number Of	II
	Equipment Name	Number Of	Hours Per Day
Dorr	ers Composite	Equipment 1	8
	ng Equipment Composite		6
	ng Equipment Composite	2	6
KOII	ers composite	Z	0
- Veh	icle Exhaust		
	verage Hauling Truck Round Trip Commute (mile): 20 (de	fault)	
A	trenage maining muck round mup commute (muc): 20 (de	iauit)	

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	LDGV	LDGT	HDGV	LDDV	LDI)T	HDDV	Μ
POVs	0	0	0	0	0		100.00	
L		U						
Worker Trips	5							
Average W	orker Round	l Trip Commu	te (mile):	20 (default))			
Worker Trips	S Vehicle Mix	ture (%)						
	LDGV	LDGT	HDGV	LDDV	LDI	DT	HDDV	N
POVs	50.00	50.00	0	0	0		0	
7.5.3 Paving I	Exhaust Emi			fault)				
_	Exhaust Emi posite	ssion Factors (lb/hour) (de		DM 10	DM 2 6	CIL	
Construction Graders Com	Exhaust Emi posite VO	ssion Factors (C SO _x	lb/hour) (de NOx	СО	PM 10	PM 2.5		_
Construction Const	Exhaust Emi posite VO ors 0.06	ssion Factors (C SO _x 76 0.0014	lb/hour) (de NO_x 0.3314		PM 10 0.0147	PM 2.5 0.0147	CH4 0.0061	
Construction Graders Com	Exhaust Emi posite VO ors 0.06 uction Equip	ssion Factors (C SO _x 76 0.0014 ment Composi	lb/hour) (de NO _x 0.3314 te	CO 0.5695	0.0147	0.0147	0.0061	1
Construction Const	Exhaust Emi posite VO ors 0.06 uction Equip	ssion Factors (CSOx760.0014mentCompositionCSOx	lb/hour) (de NOx 0.3314 te NOx	CO 0.5695 CO	0.0147 PM 10	0.0147 PM 2.5	0.0061 CH4	
Construction I Graders Comp Emission Facto Other Constru Emission Facto	Exhaust Emi posite Ors 0.06 uction Equip Ors 0.04	ssion Factors C SOx 76 0.0014 ment Composit C SOx 42 0.0012	lb/hour) (de NO _x 0.3314 te	CO 0.5695	0.0147	0.0147	0.0061	1
Construction Const	Exhaust Emi posite VO ors 0.06 uction Equip ors 0.04 Dozers Com	Ssion Factors C SOx 76 0.0014 ment Composite SOx 42 0.0012 posite Solution	lb/hour) (de NO _x 0.3314 te NO _x 0.2021	CO 0.5695 CO 0.3473	0.0147 PM 10 0.0068	0.0147 PM 2.5 0.0068	0.0061 CH4 0.0039	1
Construction I Graders Comp Emission Facto Other Constru Emission Facto	Exhaust Emi posite VO ors 0.06 uction Equip ors 0.04 Dozers Com VO	ssion Factors (CSOx760.0014mentCompositeCSOx420.0012positeCSOx	lb/hour) (de NOx 0.3314 te NOx	CO 0.5695 CO	0.0147 PM 10	0.0147 PM 2.5	0.0061 CH4 0.0039	
Construction I Graders Comp Emission Facto Other Constru Emission Facto Rubber Tired	Exhaust Emivoonsiteors0.06uction Equipors0.04DozersComDozersVOors0.16	ssion Factors (CSOx760.0014mentCompositeCSOx420.0012positeCSOx	lb/hour) (de NOx 0.3314 te NOx 0.2021 NOx	CO 0.5695 CO 0.3473 CO	0.0147 PM 10 0.0068 PM 10	0.0147 PM 2.5 0.0068 PM 2.5	0.0061 CH4 0.0039 CH4	
Construction I Graders Comp Emission Facto Other Constru Emission Facto Rubber Tired Emission Facto	Exhaust Emivoonsiteors0.06uction Equipors0.04DozersComDozersVOors0.16	ssion Factors C SOx 76 0.0014 ment Composit C SOx 42 0.0012 posite C SOx 71 0.0024	lb/hour) (de NOx 0.3314 te NOx 0.2021 NOx	CO 0.5695 CO 0.3473 CO	0.0147 PM 10 0.0068 PM 10	0.0147 PM 2.5 0.0068 PM 2.5	0.0061 CH4 0.0039 CH4 0.0150	1

11

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

SO_x

0.0007

VOC

0.0335

000		CO ₂ e 00306.502
		00306.502
000	0.00	
	0.026	00398.336
000	0.051	00913.820
000	0.008	00311.249
000	0.009	00361.998
000	0.032	01238.796
000	0.054	00389.005
	000	000.008 000.009 000.032

СО

0.3586

PM 10

0.0058

PM 2.5

0.0058

CH₄

0.0030

CO₂e

66.872

NO_x

0.1857

13 14

7.5.4 Paving Phase Formula(s)

Emission Factors

- 15
- 16 Construction Exhaust Emissions per Phase
- 17 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 1819 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 20 NE: Number of Equipment
- 21 WD: Number of Total Work Days (days)
- 22 H: Hours Worked per Day (hours)
- 23 EF_{POL} : Emission Factor for Pollutant (lb/hour)
- 24 2000: Conversion Factor pounds to tons
- 2526 Vehicle Exhaust Emissions per Phase
- 27 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

	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 $(1 \text{ yd}^3/27 \text{ ft}^3)$
	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)
	······································
Vp	$_{\text{OL}} = (\text{VMT}_{\text{VE}} * 0.002205 * \text{EF}_{\text{POL}} * \text{VM}) / 2000$
• 1	
	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
•	
	Vorker Trips Emissions per Phase
VN	$MT_{WT} = WD * WT * 1.25 * NE$
	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_P	$_{DL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
	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 Cossing Emissions non Dhose
	off-Gassing Emissions per Phase
VC	$OC_P = (2.62 * PA) / 43560$
	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
<u> </u>	1 AAA VA WAV
0.1	
8.]	General Information & Timeline Assumptions
- A	dd or Remove Activity from Baseline? Add
- A	ctivity Location
	County: Taylor
	Regulatory Area(s): NOT IN A REGULATORY AREA

54 - Activity Title: B-21 TGOs

B-104 NOVEMBER 2023

1	- Activity Description	on:
2	2,280 annual TC	GOs
3		
4	- Activity Start Dat	e
5	Start Month:	1
6	Start Year:	2025
7		
8	- Activity End Date	
9	Indefinite:	Yes
10	End Month:	N/A
11	End Year:	N/A
12		

13 - 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		

14 15

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000
PM 10	0.000000

Pb 0.000000 NH₃ 0.000000 CO₂e 15180.9

Emissions Per Year (TONs)

14.744980

Pollutant

PM 2.5

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

16 17 18

19 8.2.1 Aircraft & Engines Assumptions

8.2 Aircraft & Engines

20	
21	- Aircraft & Engine

21	in cruit & Engine			
22	Aircraft Designation:	B-2A		
23	Engine Model:	F118-GE	2-100	
24	Primary Function:	Transpor	t - Bomber	
25	Aircraft has After bu	n: No		
26	Number of Engines:	4		
27				
28	- Aircraft & Engine Surro	gate		
29	Is Aircraft & Engine a	Nurrogate?	No	
30	Original Aircraft Nan	ne:		
31	Original Engine Name	2:		
32				
33	8.2.2 Aircraft & Engine	es Emission	Factor(s)	
34	_			
35	- Aircraft & Engine Emiss	ions Factors	(lb/1000lb fu	uel)
	Fuel Flow	VOC	SO _x]

	Fuel Flow	VOC	SOx	NO _x	СО	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

	B-10
NOVEMBER 2023	

1	8.3 Flight Operations			
2 3 4	8.3.1 Flight Operations As	sumptions		
5 6 7 8 9 10	- Flight Operations Number of Aircraft: Flight Operation Cycle T Number of Annual Flight Number of Annual Trim	Operation Cycles for al	CP (Close Pattern) l Aircraft:	12 2280 0
11	- Default Settings Used: N	lo		
12 13 14 15 16 17 18	- Flight Operations TIMs (Tin Taxi [Idle] (mins): Approach [Approach] (m Climb Out [Intermediate Takeoff [Military] (mins) Takeoff [After Burn] (min	ins): (mins): :	0 6.01 4.99 0.68 0	
19 20 21 22 23	Per the Air Emissions Guide for after burner for takeoff is 50% i flight profile was used)			
24 25 26 27 28 29 30	- Trim Test Idle (mins): Approach (mins): Intermediate (mins): Military (mins): AfterBurn (mins):	0 0 0 0 0		
31	8.3.2 Flight Operations Fo	rmula(s)		
32 33 34 35	- Aircraft Emissions per Mod AEM _{POL} = (TIM / 60) * (FC / 1			
36 37 38 39 40 41 42 43 44 45	AEM _{POL} : Aircraft Emissio TIM: Time in Mode (min) 60: Conversion Factor mir FC: Fuel Flow Rate (lb/hr) 1000: Conversion Factor p EF: Emission Factor (lb/10 NE: Number of Engines FOC: Number of Flight Op 2000: Conversion Factor p	ounds to 1000pounds 000lb fuel) peration Cycles (for all air		
46 47 48	- Aircraft Emissions for Fligh $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDL}$			
49 50 51 52 53 54	AE _{FOC} : Aircraft Emissions AEM _{IDLE_IN} : Aircraft Emis AEM _{IDLE_OUT} : Aircraft Em AEM _{APPROACH} : Aircraft Em AEM _{CLIMBOUT} : Aircraft Em AEM _{TAKEOFF} : Aircraft Em	sions for Idle-In Mode (T issions for Idle-Out Mode nissions for Approach Mo nissions for Climb-Out M	e (TONs) ode (TONs) ode (TONs)	

B-106	NOVEMBER 2023			
1	- Aircraft Emissions per Mode for Trim per Year			
2	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000			
3				
4	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)			
5	TD: Test Duration (min)			
6	60: Conversion Factor minutes to hours			
7	FC: Fuel Flow Rate (lb/hr)			
8	1000: Conversion Factor pounds to 1000pounds			
9	EF: Emission Factor (lb/1000lb fuel)			
10	NE: Number of Engines			
11	NA: Number of Aircraft			
12	NTT: Number of Trim Test			
13 14	2000: Conversion Factor pounds to TONs			
14	- Aircraft Emissions for Trim per Year			
16	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$			
17				
18	AE _{TRIM} : Aircraft Emissions (TONs)			
19	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)			
20	AEPS _{APPROACH} : Aircraft Emissions for Approach Power Setting (TONs)			
21	AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs)			
22	AEPS _{MILITARY} : Aircraft Emissions for Military Power Setting (TONs)			
23	AEPS _{AFTERBURN} : Aircraft Emissions for After Burner Power Setting (TONs)			
24 25				
25				
26	9. Aircraft			
27				
28	01 Canaral Information & Timalina Assumptions			
	9.1 General Information & Timeline Assumptions			
29	-			
29 30	- Add or Remove Activity from Baseline? Remove			
29 30 31	- Add or Remove Activity from Baseline? Remove			
29 30 31 32	 - Add or Remove Activity from Baseline? Remove - Activity Location 			
29 30 31 32 33	 - Add or Remove Activity from Baseline? Remove - Activity Location County: Taylor 			
29 30 31 32 33 34	 - Add or Remove Activity from Baseline? Remove - Activity Location 			
29 30 31 32 33	 - Add or Remove Activity from Baseline? Remove - Activity Location County: Taylor 			
29 30 31 32 33 34 35	 Add or Remove Activity from Baseline? Remove Activity Location County: Taylor Regulatory Area(s): NOT IN A REGULATORY AREA 			
29 30 31 32 33 34 35 36	 Add or Remove Activity from Baseline? Remove Activity Location County: Taylor Regulatory Area(s): NOT IN A REGULATORY AREA 			
29 30 31 32 33 34 35 36 37 38 39	 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 			
29 30 31 32 33 34 35 36 37 38 39 40	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	 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 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	 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: 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	 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: 			
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	 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: 			

СО	-0.856407
PM 10	-2.465150

- 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

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

0	- micrait & Englis	
9	Aircraft Designation:	B-1B
10	Engine Model:	F101-GE-102
11	Primary Function:	Transport - Bomber
12	Aircraft has After burn:	Yes
13	Number of Engines:	4
14		
15	- Aircraft & Engine Surrogat	e
16	Is Aircraft & Engine a Su	irrogate? No
17	Original Aircraft Name:	
18	Original Engine Name:	
19		

20 9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

	ste ingne operations	
25		
26	9.3.1 Flight Operations Assumptions	
27		
28	- Flight Operations	
29	Number of Aircraft:	
30	Flight Operation Cycle Type:	CP (Close Pattern)
31	Number of Annual Flight Operation Cycles	for all Aircraft:
32	Number of Annual Trim Test(s) per Aircraft	t :
33		
34	- Default Settings Used: No	
35		
36	- Flight Operations TIMs (Time In Mode)	
37	Taxi [Idle] (mins):	0
38	Approach [Approach] (mins):	4.22
39	Climb Out [Intermediate] (mins):	2.88
40	Takeoff [Military] (mins):	0.56
		D 21 MOD 2 OD MOD

CO ₂ e	-2980.8

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

652.2 B-107

B-108 NOVEMBER 2023 0 1 Takeoff [After Burn] (mins): 2 3 Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with 4 after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 5 flight profile was used) 6 7 - Trim Test 8 Idle (mins): 0 9 **Approach** (mins): 0 10 Intermediate (mins): 0 11 Military (mins): 0 12 AfterBurn (mins): 0 13 14 9.3.2 Flight Operations Formula(s) 15 16 - Aircraft Emissions per Mode for Flight Operation Cycles per Year 17 $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$ 18 19 AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs) 20 TIM: Time in Mode (min) 21 60: Conversion Factor minutes to hours 22 FC: Fuel Flow Rate (lb/hr) 23 1000: Conversion Factor pounds to 1000pounds 24 EF: Emission Factor (lb/1000lb fuel) 25 NE: Number of Engines FOC: Number of Flight Operation Cycles (for all aircraft) 26 27 2000: Conversion Factor pounds to TONs 28 29 - Aircraft Emissions for Flight Operation Cycles per Year 30 $AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$ 31 AE_{FOC}: Aircraft Emissions (TONs) 32 33 AEM_{IDLE IN}: Aircraft Emissions for Idle-In Mode (TONs) 34 AEMIDLE OUT: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) 35 36 AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) 37 AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs) 38 39 - Aircraft Emissions per Mode for Trim per Year 40 AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000 41 42 AEPS_{POL}: Aircraft Emissions per Pollutant & Power Setting (TONs) 43 TD: Test Duration (min) 44 60: Conversion Factor minutes to hours 45 FC: Fuel Flow Rate (lb/hr) 1000: Conversion Factor pounds to 1000pounds 46 47 EF: Emission Factor (lb/1000lb fuel) 48 NE: Number of Engines 49 NA: Number of Aircraft 50 NTT: Number of Trim Test 51 2000: Conversion Factor pounds to TONs 52 53 - Aircraft Emissions for Trim per Year 54 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$ 55

$\begin{array}{llllllllllllllllllllllllllllllllllll$	AEPS _{IDLE} : Ait AEPS _{APPROACH} AEPS _{INTERMED} AEPS _{MILITARY} :	aft Emissions (TONs) ccraft Emissions for Idle Power Setting : Aircraft Emissions for Approach Pow _{IATE} : Aircraft Emissions for Intermedia Aircraft Emissions for Military Power N: Aircraft Emissions for After Burner	ver Setting (TONs) te Power Setting (TONs) Setting (TONs)	s)
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 Year: 2025 • Activity Embasions: • Activity Emissions: • Pollutant				
- 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 Productant Emissions Per Year (TONs) VOC - 0.080572 SO_k - 2.155312 NO_k - 2.648182 OC_k - 0.080572 OC_k - 0.080000 OC_k - 0.080000 OC_k - 0.080000 OC_k - 0.080000 OC_k - 0.000000 OC_k		formation & Timeline Assumption	ne	
- 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: $\frac{Pollutant Emissions Per Year (TONs)}{VOC - 0.080572}$ $\frac{PM 2.5 - 2.437316}{Pb - 0.000000}$ $\frac{PM 2.5 - 2.437316}{Pb - 0.000000}$ $\frac{PM 2.5 - 2.437316}{Pb - 0.000000}$ $\frac{PM 10 - 2.719319}$ $\frac{Pollutant Emissions Per Year (TONs)}{PM 2.5 - 0.000000}$ $\frac{PM 2.5 - 0.000000}{PM 10 - 0.000000}$ $\frac{PM 2.5 - 0.000000}{PM 2.5 - 0.000000}$ $\frac{PM 2.5 - 0.000000}{PM 10 - 0.000000}$ $\frac{PM 2.5 - 0.000000}{PM 10 - 0.000000}$		-	113	
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:1Start Month:1Start Year:2025- Activity End Date Indefinite:Indefinite:Yes End Month:N/A- Activity Emissions: $VOC cdot - 0.080572 \\ VOC cdot - 0.080572 \\ SO_x cdot - 2.719319 \\ PM 10 cdot - 2.719319 \\ \hline PM 10 cdot - 2.719319 \\ \hline PM 10 cdot - 2.719319 \\ \hline PM 2.5 cdot - 6514.3 \\ PM 2.5 cdot - 6514.3 \\ PM 2.5 cdot - 6514.3 \\ PM 10 cdot - 2.719319 \\ \hline PM 2.5 cdot - 0.000000 \\ PM 10 cdot - 0.000000 \\ PM 2.5 cdo$	- Add or Remove	Activity from Baseline? Remove		
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:1Start Month:1Start Year:2025- Activity End Date Indefinite:Indefinite:Yes End Month:N/A- Activity Emissions: $VOC cdot - 0.080572 \\ VOC cdot - 0.080572 \\ SO_x cdot - 2.719319 \\ PM 10 cdot - 2.719319 \\ \hline PM 10 cdot - 2.719319 \\ \hline PM 10 cdot - 2.719319 \\ \hline PM 2.5 cdot - 6514.3 \\ PM 2.5 cdot - 6514.3 \\ PM 2.5 cdot - 6514.3 \\ PM 10 cdot - 2.719319 \\ \hline PM 2.5 cdot - 0.000000 \\ PM 10 cdot - 0.000000 \\ PM 2.5 cdo$	- Activity Location	1		
Regulatory Area(s): NOT IN A REGULATORY AREA Activity Title: B-1B Airspace Operations Activity Description: 9,216 minutes annually 9,216 minutes annually Activity Start Date Start Month: 1 Start Year: 2025 Activity End Date Indefinite: Yes End Month: N/A Activity Emissions: Pollutant Emissions Per Year (TONs) VOC -0.080572 -2.437316 So _x -2.155312 Pb 0.000000 NOx -26.488182 Pb 0.000000 CO -1.712164 Pb 0.000000 PM 10 -2.719319 Part!: Pollutant Emissions Per Year (TONs) VOC 0.000000 NO _x 0.000000 Pb 0.000000 NO _x 0.000000 Pb 0.000000 Pb 0.000000 NO _x 0.000000 Pb 0.000000 Pb 0.000000 NO _x 0.000000 Pb 0.000000 Pb 0.000000 NO _x 0.0000000 NO _x 0.0000000			nn; Scurry; Stonewall	
$\begin{array}{c} \textbf{Activity Description:}\\ 9,216 minutes annually\\ \hline \textbf{Activity Start Date}\\ \textbf{Start Month: 1}\\ \textbf{Start Year: 2025}\\ \hline \textbf{Activity End Date}\\ \textbf{Indefinite: Yes}\\ \textbf{End Month: N/A}\\ \textbf{End Year: N/A}\\ \hline \textbf{Activity Emissions:}\\ \hline \hline \textbf{VOC} & -0.080572 \\ \hline \textbf{VOC} & -0.080572 \\ \hline \textbf{VOC} & -2.155312 \\ \hline \textbf{NO}_{x} & -2.155312 \\ \hline \textbf{NO}_{x} & -2.155312 \\ \hline \textbf{NO}_{x} & -2.719319 \\ \hline \textbf{Activity Emissions [Aerospace Ground Equipment (AGE) part]:}\\ \hline \hline \hline \textbf{Pollutant} & \hline \textbf{Emissions Per Year (TONs)} \\ \hline \textbf{VOC} & 0.000000 \\ \hline \textbf{NO}_{x} & -2.719319 \\ \hline \textbf{Activity Emissions [Aerospace Ground Equipment (AGE) part]:}\\ \hline \hline \hline \textbf{Pollutant} & \hline \textbf{Emissions Per Year (TONs)} \\ \hline \textbf{VOC} & 0.000000 \\ \hline \textbf{NO}_{x} & 0.000000 \\ \hline \textbf{NO}$				
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	- Activity Title:	B-1B Airspace Operations		
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Indefinite: Yes End Month: N/A End Year: N/A - Activity Emissions: Pollutant Emissions Per Year (TONs) VOC -0.080572 PM 2.5 -2.437316 SO _x -2.155312 Pb 0.000000 NO _x -26.488182 CO ₂ e -6514.3 PM 10 -2.719319 Pollutant Emissions Per Year (TONs) VOC 0.000000 PM 2.5 0.000000 CO ₂ e -6514.3 P Pollutant Emissions Per Year (TONs) Pollutant Emissions Per Year (COs) VOC 0.000000 Ph 2.5 0.000000 SO _x 0.000000 Pb 0.000000 NO _x 0.000000 Pb 0.000000 NO _x 0.000000 Pb 0.000000 NH ₃ 0.000000 Pb 0.000000 NH ₃ 0.000000 Pb 0.000000 NH ₃ 0.000000 Pb 0.000000 PM 10 0.000000 Pb 0.0 NH ₃ 0.000000 Pb	Start Year:	2025		
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CO 0.000000 CO2e 0.0 PM 10 0.000000 0.0 0.0				
PM 10 0.000000				
				0.0
10.2 Aircraft & Engines	1 111 10	0.00000		1
	10.2 Aircraft &	Engines		
	10.2 Antian &	Elignics		

- 41 Aircraft & Engine
- 42 Aircraft Designation: B-1B

B-110	NOVEMBER 20	23							
1	Engine Mo	F101-GI	E-102						
2	Primary Function:			rt - Bomber					
3		as After burn:							
4	Number of	f Engines:	4						
5 6	- Aircraft & E	naina Surraga	to						
7		t & Engine a S		No					
8		ircraft Name:							
9	Original E	Ingine Name:							
10	10.0.0								
11 12	10.2.2 Aircra	aft & Engines	s Emissio	n Factor(s)					
12	- Aircraft & E	ngine Emissio	ns Factors	(lb/1000lb fi	1el)				
10		Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CO ₂ e
	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 After Burn	7828.00 15314.00	0.12	1.07 1.07	12.83 16.92	0.83 43.49	1.68 2.87	1.51 2.58	3234 3234
14	Alter Bulli	15514.00	1.40	1.07	10.92	43.49	2.07	2.30	3234
15	10.3 Flight O	Operations							
16	8	1							
17	10.3.1 Flight	Operations	Assumpti	ons					
18									
19 20	- Flight Opera Number of						17	20	
20		eration Cycle 7	Fvne∙		LEP (Lo	w Flight Pat		20	
22		f Annual Fligh		on Cycles for			1		
23		f Annual Trin	-	-			0		
24									
25	- Default Settin	ngs Used:	No						
26 27	- Flight Opera	tions TIMs (T	ime In Mo	de)					
28	Taxi [Idle]			uc)	0				
29		[Approach] (I	mins):		0				
30		t [Intermediat			9216				
31	Takeoff [Military] (mins):			0					
32 33	Takeoff [A	fter Burn] (m	iins):		0				
33 34	Per the Air Emi	issions Guide f	or Air Forc	e Mobile Sou	rces, the def	aults values	for military a	aircraft equin	ped with
35	Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.				1				
36	flight profile wa	as used)	• •			· •			
37									
38	- Trim Test		0						
39 40	Idle (mins) Approach		0 0						
40		ate (mins):	0						
42	Military (1		0						
43	AfterBurn	(mins):	0						
44		• • •		`					
45 46	10.3.2 Flight	Operations	rormula(S)					
46 47	- Aircraft Emi	ssions ner Mo	de for Flio	ht Operation	n Cycles ner	Year			
48	$AEM_{POL} = (TIN)$					- UII			
			/						

NOVEMBER 2023 B-111

- 1 AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs) 2 TIM: Time in Mode (min) 3 60: Conversion Factor minutes to hours 4 FC: Fuel Flow Rate (lb/hr) 5 1000: Conversion Factor pounds to 1000pounds 6 EF: Emission Factor (lb/1000lb fuel) 7 NE: Number of Engines 8 FOC: Number of Flight Operation Cycles (for all aircraft) 9 2000: Conversion Factor pounds to TONs 10 11 - Aircraft Emissions for Flight Operation Cycles per Year 12 $AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$ 13 14 AE_{FOC}: Aircraft Emissions (TONs) 15 AEM_{IDLE IN}: Aircraft Emissions for Idle-In Mode (TONs) 16 AEMIDLE OUT: Aircraft Emissions for Idle-Out Mode (TONs) 17 AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) 18 AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) 19 AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs) 20 21 - Aircraft Emissions per Mode for Trim per Year 22 AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000 23 24 AEPS_{POL}: Aircraft Emissions per Pollutant & Power Setting (TONs) 25 TD: Test Duration (min) 26 60: Conversion Factor minutes to hours 27 FC: Fuel Flow Rate (lb/hr) 28 1000: Conversion Factor pounds to 1000pounds 29 EF: Emission Factor (lb/1000lb fuel) 30 NE: Number of Engines 31 NA: Number of Aircraft 32 NTT: Number of Trim Test 33 2000: Conversion Factor pounds to TONs 34 35 - Aircraft Emissions for Trim per Year 36 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$ 37 38 AE_{TRIM}: Aircraft Emissions (TONs) 39 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) 40 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) 41 AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs) 42 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) 43 AEPSAFTERBURN: Aircraft Emissions for After Burner Power Setting (TONs)
- 44

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1B.4.4Dyess AFB Snapshot Scenario Air Conformity Applicability Model Report2Record Of Air Analysis (ROAA)

3 1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 4 an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force 5 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 6 7 summary of the ACAM analysis. 8 9 a. Action Location: 10 DYESS AFB Base: 11 State: Texas 12 **County(s):** Taylor; Borden; Dawson; Fisher; Garza; Kent; Lynn; Scurry; Stonewall 13 **Regulatory Area(s):** NOT IN A REGULATORY AREA 14 15 b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess 16 AFB or Whiteman AFB 17 18 c. Project Number/s (if applicable): 19 20 d. Projected Action Start Date: 1 / 2025 21 22 e. Action Description: 23 24 Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at 25 installations that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide 26 the only stealth bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an 27 era of renewed great power competition. The installation will support training of crewmembers and personnel in 28 the operation and maintenance of the B-21 aircraft in an appropriate geographic location that can provide 29 sufficient airfield, facilities, infrastructure, and airspace to support the B-21 training and operations. 30 To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the 31 32 B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and 33 OT&E, as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to 34 support and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 35 beddown of the B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and 36 operational activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is 37 selected as the MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 38 beddown location. Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed 39 those analyzed in this EIS and construction activities are anticipated to the be the same for either MOB location. 40 Therefore, the analysis presented in this EIS sufficiently represents potential impacts associated with either the 41 MOB 2 or MOB 3 beddown actions for either location. 42 43 The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either 44 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. 45 46 47 Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic 48 issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft 49 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 50 51 incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place 52 and all B-1s or B-2s have been removed. 53

1		
2	f. Point of Contact:	
3	Name:	Brad Boykin
4	Title:	CTR
5	Organization:	Leidos
6	Email:	boykinb@leidos.com
7	Phone Number:	571-521-8765
8		
9		
10	2. Air Impact Anal	ysis: Based on the attainment status at the action location, the requirements of the General
11	Conformity Rule are:	
12	-	applicable
13		X not applicable
14		
15	Total net direct and indir	rect emissions associated with the action were estimated through ACAM on a calendar-year
16	basis for the start of the	action through achieving "steady state" (i.e., net gain/loss upon action fully implemented)
17	emissions. The ACAM	analysis used the latest and most accurate emission estimation techniques available; all
18	algorithms, emission fac	tors, and methodologies used are described in detail in the USAF Air Emissions Guide for
19	Air Force Stationary Sou	rces, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air
20	Emissions Guide for Air	Force Transitory Sources.
21		
22		rs" were used in the analysis to provide an indication of the significance of potential impacts
23		urrent ambient air quality relative to the National Ambient Air Quality Standards
24		nificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major
25		ons occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS)
26		s values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions
27	e	re "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a
28	significant impact; howe	ever, 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 INSIGNIFICANCE INDICATOR				
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	27.631	250		
NOx	157.832	250		
СО	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 - (St	eady State)		
Pollutant Action Emissions INSIGNIFICANCE INDICATOR				

NOT IN A REGULATOR	Y AREA		
VOC	3.447	250	
NOx	129.885	250	
СО	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		

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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.

6 7 8 9 10 Brad Boykin, CTR 11

4/2/2023 DATE

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

2 **1. General Information**

3	
4	- Action Location
5	Base: WHITEMAN AFB
6	State: Missouri
7	County(s): Johnson
8	Regulatory Area(s): NOT IN A REGULATORY AREA
9 10	- Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB
11	or Whiteman AFB
	or whitehan Arb
12	Duciest Number/s (if smalles).
13	- Project Number/s (if applicable):
14	Devision of the Article Official Device 1/2005
15	- Projected Action Start Date: 1 / 2025
16	
17	- Action Purpose and Need:
18	Therefore, the purpose of the Proposed Action is to implement the goals of the National Defense Strategy by
19	modernizing the U.S. bomber fleet capabilities. The B-21 Raider is being developed to carry conventional
20	payloads and to support the nuclear triad by providing a visible and flexible nuclear deterrent capability that will
21	assure allies and partners through the United States' commitment to international treaties.
22	
23	The need for the Proposed Action stems from advancements in the technology that is available to potential
24	adversaries of the United States. The U.S. must have advanced defense capabilities that discourage adversary
25	nations from taking action and that can respond effectively to support national defense priorities if and when
26	called upon to do so. The existing bomber fleet lacks the technology required to ensure U.S. global security and
27	long-range strike missions into the future; therefore, a new, more technologically capable system must be
28	developed and fielded to support the nation's defense.
29	developed and norded to support the nation's defense.
30	Therefore, the need for the Proposed Action is to support deterrence capabilities by basing the B-21 at installations
31	that can support the Air Force Global Strike Command's MOB 2 mission. The B-21 will provide the only stealth
32	bomber capability and capacity needed to deter, and if necessary, defeat our adversaries in an era of renewed great
33	power competition. The installation will support training of crewmembers and personnel in the operation and
34	maintenance of the B-21 aircraft in an appropriate geographic location that can provide sufficient airfield,
35	facilities, infrastructure, and airspace to support the B-21 training and operations.
36	
37	
38	- Action Description:
39	To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the
40	B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E,
41	as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support
42	and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the
43	B 21 (Dyess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational
44	activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the
45	MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location.
46	Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in
47	this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the
48	analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB
49	3 beddown actions for either location.
50	
51	The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate
52	base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace
53	and range utilization, facilities and infrastructure, and the WGF.

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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.

7 8 9

- Point of Contact

10	Name:	Brad Boykin
11	Title:	CTR
12	Organization:	Leidos
13	Email:	boykinb@leidos.com
14	Phone Number:	571-521-8765
15		

16 - 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

17 18

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.

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2. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- 29 Activity Location
- 30County:Johnson31Regulatory Area(s):
 - **Regulatory Area(s):** NOT IN A REGULATORY AREA
- 33 Activity Title: Personnel Military

35 - Activity Description: 36 Military Personnel - 777 increase

- Military Personnel 777 increase under Proposed Action
- 3738 Activity Start Date
- 39 Start Month:
- 40 **Start Year:** 2025
- 41
 42 Activity End Date
 43 Indefinite: Yes
 44 End Month: N/A

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1 - 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 ₂ e	1564.1

2.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: Civilian Personnel:

Reserve Personnel:

Support Contractor Personnel:

Air National Guard (ANG) Personnel:

3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
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22 23

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2

- Average Perso	onnel Round	Trip (Commute (mil	le):

- Default Settings Used:

- 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)

Yes

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

20 (default)

777

0

0

0

0

26 27 28

29

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 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

30

31 2.5 Personnel Formula(s)

- 32
- 33 Personnel Vehicle Miles Travel for Work Days per Year
- $\begin{array}{ll} 34 \qquad VMT_P = NP * WD * AC \\ 35 \end{array}$
- 36 VMT_P: Personnel Vehicle Miles Travel (miles/year)
- 37 NP: Number of Personnel

B-118	NOVEMBER 2023		
1	WD: Work Da	ws par Vaar	
2		Commute (miles)	
3	AC. Average	commute (mines)	
4	- Total Vehicle Mi	les Travel per Year	
5		$+ VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$	
6			
7	VMT _{Total} : Tota	al Vehicle Miles Travel (miles)	
8		ve Duty Personnel Vehicle Miles Travel (mil	les)
9		an Personnel Vehicle Miles Travel (miles)	,
10		ort Contractor Personnel Vehicle Miles Trav	el (miles)
11		National Guard Personnel Vehicle Miles Tra	
12	VMT _{AFRC} : Res	serve Personnel Vehicle Miles Travel (miles)
13			
14	- Vehicle Emission	s per Year	
15	$V_{POL} = (VMT_{Total} *$	0.002205 * EF _{POL} * VM) / 2000	
16			
17		Emissions (TONs)	
18		al Vehicle Miles Travel (miles)	
19		version Factor grams to pounds	
20		on Factor for Pollutant (grams/mile)	
21		l On Road Vehicle Mixture (%)	
22	2000: Convers	sion Factor pounds to tons	
23			
24	. .		
25	3. Personnel		
26			
27	3.1 General Info	ormation & Timeline Assumptions	
28			
29	- Add or Remove	Activity from Baseline? Remove	
30			
31	- Activity Location		
32		hnson	
33	Regulatory A	rea(s): NOT IN A REGULATORY ARE.	A
34 35	A ativity Titla.	Personnel - Civilian and Contractor	
36	- Activity Title:	reisonnei - Civinan and Contractor	
30 37	- Activity Descript	ion:	
38	Civilian - (-79)		
39	Contractor - (-2		
40	Contractor (23 1)	
41	- Activity Start Da	te	
42	Start Month:	1	
43	Start Year:	2025	
44			
45	- Activity End Dat	e	
46	Indefinite:	Yes	
47	End Month:	N/A	
48	End Year:	N/A	
49			
50	- Activity Emission		
	Pollutant	Emissions Per Year (TONs)	Polluta
	VOC	-0.449837	PM 2.5
	SO _x	-0.004701	Pb
	NO _x	-0.298778	NH ₃

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.009917
Pb	0.000000
NH ₃	-0.046260

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СО	-6.471115	CO ₂ e	-630.1
PM 10	-0.010660		
3.2 Personnel Assur	nptions		
- Number of Personne	l		
Active Duty Perso	nnel:	0	
Civilian Personne	l:	79	
Support Contract	or Personnel:	234	
Air National Guai	d (ANG) Personnel:	0	
Reserve Personne	l:	0	
- Default Settings Used	l: Yes		
- Average Personnel R	ound Trip Commute (1	mile): 20 (default)	
- Personnel Work Sch			
Active Duty Perso	nnel:	5 Days Per Week (default)	
Civilian Personne		5 Days Per Week (default)	
Support Contract	or Personnel:	5 Days Per Week (default)	
	d (ANG) Personnel:	4 Days Per Week (default)	
Reserve Personne	:	4 Days Per Month (default)	

3.3 Personnel On Road Vehicle Mixture 22 23

24 - 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			

25 26

3.4 Personnel Emission Factor(s) 27

- On Road Vehicle Emission Factors (grams/mile) 28

	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

29

30 **3.5** Personnel Formula(s)

31

32 - Personnel Vehicle Miles Travel for Work Days per Year

- 33 $VMT_P = NP * WD * AC$
- 34 35
- VMT_P: Personnel Vehicle Miles Travel (miles/year)
- 36 NP: Number of Personnel 37
 - WD: Work Days per Year
- 38 AC: Average Commute (miles) 39
- 40 - Total Vehicle Miles Travel per Year
- 41 $VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

B-120	NOVEMBER 2023								
1	VMT _T Tot	al Vehicle Miles Travel (miles)							
2		ve Duty Personnel Vehicle Miles Travel (n	niles)						
3	VMT _C : Civilian Personnel Vehicle Miles Travel (miles)								
4	VMT_{SC} : Support Contractor Personnel Vehicle Miles Travel (miles)								
5	VMT _{ANG} : Air National Guard Personnel Venicle Miles Travel (miles)								
6		serve Personnel Vehicle Miles Travel (mil							
7	hine								
8	- Vehicle Emission	s per Year							
9	$V_{POL} = (VMT_{Total} *$	0.002205 * EF _{POL} * VM) / 2000							
10									
11	V _{POL} : Vehicle	Emissions (TONs)							
12	VMT _{Total} : Tota	al Vehicle Miles Travel (miles)							
13		version Factor grams to pounds							
14		on Factor for Pollutant (grams/mile)							
15		l On Road Vehicle Mixture (%)							
16	2000: Convers	sion Factor pounds to tons							
17									
18									
19	4. Aircraft								
20									
21	4.1 General Info	ormation & Timeline Assumptions							
22									
23	- Add or Remove	Activity from Baseline? Remove							
24									
25	- Activity Location								
26		hnson							
27	Regulatory A	rea(s): NOT IN A REGULATORY AR	REA						
28	A attaite Titlas								
29 30	- Activity Title:	B-2A LTOs							
31	- Activity Descript	ion:							
32	920 annual LT								
33	920 annuar E1								
34	- Activity Start Da	te							
35	Start Month:	1							
36	Start Year:	2025							
37									
38	- Activity End Dat	e							
39	Indefinite:	Yes							
40	End Month:	N/A							
41	End Year:	N/A							
42									
43	- Activity Emission								
	Pollutant	Emissions Per Year (TONs)	Pollutant						
	VOC	-4.779410	PM 2.5						
	SO _x	-8.638378	Pb						
	NO _x	-123.122483	NH ₃						
	CO PM 10	-68.786724 -12.913408	CO ₂ e						
44	TIVI IU	-12.713400							
44 45	- Activity Emission	ns [Flight Operations (includes Trim To	est & APU) part]:						

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-2.395346	PM 2.5	-9.503087
SO _x	-5.562943	Pb	0.000000

Emissions Per Year (TONs) -11.440410 0.000000 0.000000 -19844.1

NOVEMBER 2023

			HO / El
NO _x	-62.802896	NH ₃	0.000000
CO	-52.086423	CO ₂ e	-16951.3
PM 10	-10.890099		

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

•		
6	- Aircraft & Engine	
7	Aircraft Designation:	B-2A
8	Engine Model:	F118-GE-100
9	Primary Function:	Transport - Bomber
10	Aircraft has After burn:	No
11	Number of Engines:	4
12		
13	- Aircraft & Engine Surrogat	e
14	Is Aircraft & Engine a Su	irrogate? No
15	Original Aircraft Name:	
16	Original Engine Name:	
17		

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

An cruit & Englite Emissions Tuctors (10/100010 Tuct)										
	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e		
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		

4.3.1 Flight Operations Assumptions

4.3 Flight Operations

26	- Flight Operations		
27	Number of Aircraft:		12
28	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
29	Number of Annual Flight Operation Cycles	for all Aircraft:	920
30	Number of Annual Trim Test(s) per Aircra	ft:	12
31			
32	- Default Settings Used: Yes		
33			
34	- Flight Operations TIMs (Time In Mode)		
35	Taxi [Idle] (mins):	47.7 (default)	
36	Approach [Approach] (mins):	5.2 (default)	
37	Climb Out [Intermediate] (mins):	1.6 (default)	
38	Takeoff [Military] (mins):	0.7 (default)	
39	Takeoff [After Burn] (mins):	0 (default)	
40			

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after

burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test B-122 NOVEMBER 2023 1 12 (default) Idle (mins): 2 Approach (mins): 27 (default) 3 **Intermediate (mins):** 9 (default) 4 Military (mins): 12 (default) 5 AfterBurn (mins): 0 (default) 6 7 4.3.2 Flight Operations Formula(s) 8 9 - Aircraft Emissions per Mode for Flight Operation Cycles per Year 10 AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000 11 12 AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs) TIM: Time in Mode (min) 13 14 60: Conversion Factor minutes to hours 15 FC: Fuel Flow Rate (lb/hr) 16 1000: Conversion Factor pounds to 1000pounds 17 EF: Emission Factor (lb/1000lb fuel) 18 NE: Number of Engines 19 FOC: Number of Flight Operation Cycles (for all aircraft) 20 2000: Conversion Factor pounds to TONs 21 22 - Aircraft Emissions for Flight Operation Cycles per Year 23 $AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$ 24 25 AE_{FOC}: Aircraft Emissions (TONs) 26 AEM_{IDLE IN}: Aircraft Emissions for Idle-In Mode (TONs) 27 AEMIDLE OUT: Aircraft Emissions for Idle-Out Mode (TONs) 28 AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) 29 AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) 30 AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs) 31 32 - Aircraft Emissions per Mode for Trim per Year 33 AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000 34 35 AEPS_{POL}: Aircraft Emissions per Pollutant & Power Setting (TONs) 36 TD: Test Duration (min) 37 60: Conversion Factor minutes to hours 38 FC: Fuel Flow Rate (lb/hr) 39 1000: Conversion Factor pounds to 1000pounds 40 EF: Emission Factor (lb/1000lb fuel) 41 NE: Number of Engines 42 NA: Number of Aircraft 43 NTT: Number of Trim Test 44 2000: Conversion Factor pounds to TONs 45 46 - Aircraft Emissions for Trim per Year 47 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$ 48 49 AE_{TRIM}: Aircraft Emissions (TONs) 50 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) 51 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) 52 AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs) 53 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) 54 AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs) 55

DRAFT | ENVIRONMENTAL IMPACT STATEMENT

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	СО	PM 10	PM 2.5	CO ₂ e
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

28		
29	- Engine Test Cell	
30	Total Number of Aircraft Engines Tested Annually:	48
31		
32	- Default Settings Used: No	
33		
34	- Annual Run-ups / Test Durations	
35	Annual Run-ups (Per Aircraft Engine): 1	
36	Idle Duration (mins): 12	
37	Approach Duration (mins): 27	
38	Intermediate Duration (mins): 9	
39	Military Duration (mins): 12	
40	After Burner Duration (mins): 0	
41		
42	4.5.2 Aircraft Engine Test Cell Emission Factor(s)	
43	-	
44	- See Aircraft & Engines Emission Factor(s)	
45	-	
46	4.5.3 Aircraft Engine Test Cell Formula(s)	
47	E ()	

B-124 NOVEMBER 2023 1 - Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) 2 $\text{TestCellPS}_{\text{POL}} = (\text{TD} / 60) * (\text{FC} / 1000) * \text{EF} * \text{NE} * \text{ARU} / 2000$ 3 4 TestCellPS_{POL}: Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) 5 TD: Test Duration (min) 6 60: Conversion Factor minutes to hours 7 FC: Fuel Flow Rate (lb/hr) 8 1000: Conversion Factor pounds to 1000pounds 9 EF: Emission Factor (lb/1000lb fuel) 10 NE: Total Number of Engines (For All Aircraft) 11 ARU: Annual Run-ups (Per Aircraft Engine) 2000: Conversion Factor pounds to TONs 12 13 - Aircraft Engine Test Cell Emissions per Year 14 15 TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + 16 **TestCellPS**_{AFTERBURN} 17 18 TestCell: Aircraft Engine Test Cell Emissions (TONs) 19 TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) 20 TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) 21 TestCellPSINTERMEDIATE: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) 22 23 TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs) 24 25 4.6 Aerospace Ground Equipment (AGE) 26 27 4.6.1 Aerospace Ground Equipment (AGE) Assumptions 28 29 - Default Settings Used: Yes 30 31 - AGE Usage 32 Number of Annual LTO (Landing and Take-off) cycles for AGE: 920 33 34 - Aerospace Ground Equipment (AGE) (default) Total Number of **Operation Hours** Exempt **AGE Type** Designation AGE for Each LTO Source? 1.5 MC-1A - 18.4hp No Air Compressor 1 1 12 No Air Conditioner Ace 401

35

36 **4.6.2** Aerospace Ground Equipment (AGE) Emission Factor(s)

37 38

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

2

3

2

1.5

4

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Designation	Fuel	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CO ₂ e
	Flow							
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

Bomb Lift

Light Cart

Start Cart

Heater

Generator Set

Hydraulic Test Stand

No

No

No

No

No

No

MJ-40

H1

NF-2

A/M32A-86D

MJ-2/TTU-229

A/M32A-60A

1

1

1

1

1

1

B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

NOVEMBER 2023 B-125

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 Equ	ipment (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
- 4 Activity End Date
- 35 **Indefinite:** Yes
- 36 End Month: N/A
- **End Year:** N/A
- 38 39

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	10.368519
SO _x	16.900573
NO _x	228.994073
СО	146.717567
PM 10	22.796506

Pollutant	Emissions Per Year (TONs)
PM 2.5	20.114763
Pb	0.000000
NH ₃	0.000000
CO ₂ e	37372.1

40

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	5.158581	PM 2.5	16.253890
SO _x	10.324859	Pb	0.000000

B-126

1

NOVEMBER 2023

NO _x	100.111293	NH ₃	0.000000
СО	110.466196	CO ₂ e	31507.5
PM 10	18.789130		

5.2 Aircraft & Engines

2 3 4 5.2.1 Aircraft & Engines Assumptions

5		
6	- Aircraft & Engine	
7	Aircraft Designation:	B-2A
8	Engine Model:	F118-GE-100
9	Primary Function:	Transport - Bomber
10	Aircraft has After burn:	No
11	Number of Engines:	4
12		
13	- Aircraft & Engine Surrogat	e
14	Is Aircraft & Engine a Su	irrogate? No
15	Original Aircraft Name:	
16	Original Engine Name:	
17		
18	522 Aircraft & Engines B	mission Factor(s)

5.2.2 Aircraft & Engines Emission Factor(s) 18 19

- Aircraft & Engine Emissions Factors (lb/1000lb fuel) 20

	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e
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

21 22 23

25

5.3.1 Flight Operations Assumptions 24

5.3 Flight Operations

26	- Flight Operations				
27	Number of Aircraft:		12		
28	Flight Operation Cycle Type:	LTO (Landing and Takeoff)			
29	9 Number of Annual Flight Operation Cycles for all Aircraft:				
30	Number of Annual Trim Test(s) per Air	·craft:	12		
31					
32	- Default Settings Used: Yes				
33					
34	- Flight Operations TIMs (Time In Mode)				
35	Taxi [Idle] (mins):	47.7 (default)			
36	Approach [Approach] (mins):	5.2 (default)			
37	Climb Out [Intermediate] (mins):	1.6 (default)			
38	Takeoff [Military] (mins):	0.7 (default)			
39	Takeoff [After Burn] (mins):	0 (default)			
40					

41 Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after 42 burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight

43 profile was used)

- 44
- 45 - Trim Test

1 12 (default) Idle (mins): 2 Approach (mins): 27 (default) 3 **Intermediate (mins):** 9 (default) 4 Military (mins): 12 (default) 5 AfterBurn (mins): 0 (default) 6 7 5.3.2 Flight Operations Formula(s) 8 9 - Aircraft Emissions per Mode for Flight Operation Cycles per Year 10 AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000 11 12 AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs) 13 TIM: Time in Mode (min) 14 60: Conversion Factor minutes to hours 15 FC: Fuel Flow Rate (lb/hr) 16 1000: Conversion Factor pounds to 1000pounds 17 EF: Emission Factor (lb/1000lb fuel) 18 NE: Number of Engines 19 FOC: Number of Flight Operation Cycles (for all aircraft) 20 2000: Conversion Factor pounds to TONs 21 22 - Aircraft Emissions for Flight Operation Cycles per Year 23 $AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$ 24 25 AE_{FOC}: Aircraft Emissions (TONs) 26 AEM_{IDLE IN}: Aircraft Emissions for Idle-In Mode (TONs) 27 AEMIDLE OUT: Aircraft Emissions for Idle-Out Mode (TONs) 28 AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) 29 AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) 30 AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs) 31 32 - Aircraft Emissions per Mode for Trim per Year 33 AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000 34 35 AEPS_{POL}: Aircraft Emissions per Pollutant & Power Setting (TONs) 36 TD: Test Duration (min) 37 60: Conversion Factor minutes to hours 38 FC: Fuel Flow Rate (lb/hr) 39 1000: Conversion Factor pounds to 1000pounds 40 EF: Emission Factor (lb/1000lb fuel) 41 NE: Number of Engines 42 NA: Number of Aircraft 43 NTT: Number of Trim Test 44 2000: Conversion Factor pounds to TONs 45 46 - Aircraft Emissions for Trim per Year 47 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$ 48 49 AE_{TRIM}: Aircraft Emissions (TONs) 50 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) 51 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) 52 AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs) 53 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) 54 AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs) 55

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- 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)

9 10 11

8

1

2 3

4 5

6 7

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

Designation	Fuel Flow	VOC	SO _x	NO _x	СО	PM 10	PM 2.5	CO ₂ e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

12 13

14 15

18 19

20

21

22

23

5.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

16 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$ 17

APU _{POL} :	Auxiliar	y Power	Unit	(APU)	Emissions	per l	Pollutant	(TONs))

- APU: Number of Auxiliary Power Units
- OH: Operation Hours for Each LTO (hour)
- LTO: Number of LTOs
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons

24 25 5.5 Aircraft Engine Test Cell 26

27 **5.5.1 Aircraft Engine Test Cell Assumptions**

28			
29	- Engine Test Cell		
30	Total Number of Aircraft Engines Tested Ann	ually:	48
31			
32	- Default Settings Used: No		
33			
34	- Annual Run-ups / Test Durations		
35	Annual Run-ups (Per Aircraft Engine): 1		
36	Idle Duration (mins): 12		
37	Approach Duration (mins): 27		
38	Intermediate Duration (mins): 9		
39	Military Duration (mins): 12		
40	After Burner Duration (mins): 0		
41			
42	5.5.2 Aircraft Engine Test Cell Emission Fact	or(s)	
43			
44	- See Aircraft & Engines Emission Factor(s)		
45			
46	5.5.3 Aircraft Engine Test Cell Formula(s)		
47			

1 2	- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) TestCellPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000								
3 4 5	TestCellPS _{POL} : TD: Test Durati		Cell Emissio	ons per Pollutant & Power	Setting (TONs)				
5		Factor minutes to ho	1.20						
6 7			uis						
8	FC: Fuel Flow Rate (lb/hr) 1000: Conversion Factor pounds to 1000pounds								
9	EF: Emission Factor (lb/1000lb fuel)								
10	NE: Total Number of Engines (For All Aircraft)								
11	ARU: Annual Run-ups (Per Aircraft Engine)								
12		on Factor pounds to 7							
13		1							
14	- Aircraft Engine Te	est Cell Emissions p	er Year						
15			CellPSAPPROA	ACH + TestCellPS _{INTER}	MEDIATE + TestCellPS _{MILITARY} +				
16	TestCellPS _{AFTERBURN}	ſ							
17									
18		aft Engine Test Cell E							
19				ons for Idle Power Setting					
20				missions for Approach Po					
21					ate Power Setting (TONs)				
22 23				nissions for Military Powe Emissions for After Burne					
23 24	T CSICCIII SAFTER	BURN. Alleran Eligin		Simissions for Arter Durite	(10143)				
25	5.6 Aerosnace Gr	ound Equipment	(AGE)						
26 26	5.0 merospace or	ound Equipment	(101)						
27	5.6.1 Aerosnace (Ground Equipmen	t (AGE) A	ssumptions					
28		Si ounu Equipinen		soumptions					
29	- Default Settings U	sed: Yes							
30									
31	- AGE Usage								
32	Number of Ann	ual LTO (Landing	and Take-o	ff) cycles for AGE: 2	013.16				
33									
34		d Equipment (AGE)							
	Total Number of	Operation Hours	Exempt	AGE Type	Designation				
	AGE	for Each LTO	Source?						
	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 2	No No	Generator Set Heater	A/M32A-86D H1				
	1	1.5	No No	Hydraulic Test Stand	MJ-2/TTU-229				
	1	1.J	140	Tryuraune rest stand	$1713^{-}2/110^{-}222/$				

1

1

36 5.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

37 38

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

4

2

Designation	Fuel	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e
	Flow							
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

Light Cart

Start Cart

No

No

NF-2

A/M32A-60A

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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

- 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

1415 6. Construction / Demolition

15 16

6.1 General Information & Timeline Assumptions

19	- Activity Location
----	---------------------

20	County: Johnson	
21	Regulatory Area(s): N	OT IN A REGULATORY AREA
22		
23	- Activity Title: Whiteman	Construction
24	-	
25	- Activity Description:	
26	See Table 2.4.5	
27		
28	- Activity Start Date	
29	Start Month: 1	
30	Start Month: 2025	
31		
32	- Activity End Data	

32 - Activity End Date

33	Indefinite:	False
34	End Month:	12
35	End Month:	2025

3637 - Activity Emissions:

- Activity Emissions.						
Pollutant	Total Emissions (TONs)					
VOC	10.189079					
SO _x	0.030512					
NO _x	9.692841					
CO	12.337556					
PM 10	102.330718					

3	Q
5	0

- 39 **6.1 Demolition Phase**
- 4041 6.1.1 Demolition Phase Timeline Assumptions
- 42
- 43 Phase Start Date

Pollutant	Total Emissions (TONs)
PM 2.5	0.360206
Pb	0.000000
NH ₃	0.016863
CO ₂ e	3298.9



5

6 7 8

9

10

11 12

13

Start Month:	1							
Start Quarter								
Start Year:	2025							
Phase Duration								
Number of Mo	onth: 12							
Number of Da								
6.1.2 Demolition	n Phase Assu	mptions						
General Demolit								
Area of Buildi								
Height of Buil	ding to be der	nolished (ft): 25					
Default Settings	Used: Yes	2						
Defuult Settings	0500. 105	,						
Average Day(s) v	worked per we	eek: 5 (d	default)					
0 . ()	-	,						
Construction Ex						1 04	TT	D D
	Equipr	ment Name				nber Of iipment	Hours	Per D
Concrete/Industria	al Saws Compo	osite			Equ	1		8
Rubber Tired Doz						1		1
	· ·					2		8
Tractors/Loaders/ Vehicle Exhaust Average Haul Average Haul	ing Truck Caj	pacity (yd³)		,	lefault) lefault)	2		
Vehicle Exhaust Average Haul Average Haul Vehicle Exhaust	ing Truck Caj ing Truck Rou Vehicle Mixtu	pacity (yd ³) und Trip Co 1re (%)	ommute (m	ile): 20 (d	lefault)			
Vehicle Exhaust Average Haul Average Haul Vehicle Exhaust	ing Truck Caj ing Truck Rot Vehicle Mixtu LDGV I	pacity (yd ³) und Trip C ure (%) LDGT	ommute (m HDGV	ile): 20 (c	lefault)	DT H		MO
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs	ing Truck Caj ing Truck Rou Vehicle Mixtu	pacity (yd ³) und Trip Co 1re (%)	ommute (m	ile): 20 (d	lefault)	DT H	DDV 00.00	
Vehicle Exhaust Average Haul Average Haul Vehicle Exhaust	ing Truck Caj ing Truck Rot Vehicle Mixtu DGV I 0 ker Round Tri	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commut	ommute (m HDGV 0	ile): 20 (c	lefault) LDI 0	DT H		MC
Vehicle Exhaust Average Haul Average Haul Vehicle Exhaust POVs Worker Trips Average Work	ing Truck Caj ing Truck Rot Vehicle Mixtu DGV I 0 ker Round Tri	pacity (yd ³) und Trip Co ure (%) LDGT 0 ip Commut e (%)	ommute (m HDGV 0	ile): 20 (c	lefault) LDI 0)T H 1		MC 0
Vehicle Exhaust Average Haul Average Haul Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I	pacity (yd ³) und Trip Co ure (%) LDGT 0 ip Commut e (%)	ommute (m HDGV 0 e (mile):	ile): 20 (c LDDV 0 20 (default)	lefault) LDI 0	DT H 1 DT H	00.00	M () M
Vehicle Exhaust Average Hault Average Hault Average Hault Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Vehicle POVs Average Work Solution Average Work <	ing Truck Caj ing Truck Rot Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00	pacity (yd ³) und Trip Co ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Facto	e (mile): HDGV 0 HDGV 0 r(s)	ile): 20 (c LDDV 0 20 (default) LDDV 0	lefault) LDI 0 LDI	DT H 1 DT H	00.00	M(0
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve United States States States States States States States States States States	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 : n Phase Emis haust Emissio	pacity (yd ³) und Trip Co ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Facto n Factors (1	e (mile): HDGV 0 HDGV 0 r(s)	ile): 20 (c LDDV 0 20 (default) LDDV 0	lefault) LDI 0 LDI	DT H 1 DT H	00.00	M (0 M (
Vehicle Exhaust Average Hault Average Hault Average Hault Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Vehicle POVs Average Work Solution Average Work <	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 : n Phase Emis haust Emissio rial Saws Com	pacity (yd ³) und Trip Co Ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Facto n Factors (Inposite	ommute (m <u>HDGV</u> 0 e (mile): <u>HDGV</u> 0 r(s) b/hour) (de	ile): 20 (c LDDV 0 20 (default) LDDV 0 fault)	lefault)	DT H 1 DT H	00.00	MC 0
Vehicle Exhaust Average Hauli Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Vehicle Worker Trips Vehicle Solution Exhaust Construction Exhaust	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 I n Phase Emission ial Saws Com VOC	pacity (yd ³) und Trip Co ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Facto n Factors (1	e (mile): HDGV 0 e (mile): HDGV 0 r(s) b/hour) (de NOx	ile): 20 (c LDDV 0 20 (default) LDDV 0 fault) CO	lefault) LDI 0 LDI	DT H 1 DT H PM 2.5	00.00	M (0 0 0
Vehicle Exhaust Average Hault Average Hault Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve United States Solution Construction Ext	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 I h Phase Emission rial Saws Com VOC 0.0336	pacity (yd ³) und Trip Control LDGT 0 ip Commut e (%) LDGT 50.00 ssion Factors (1 posite SO _x 0.0006	ommute (m <u>HDGV</u> 0 e (mile): <u>HDGV</u> 0 r(s) b/hour) (de	ile): 20 (c LDDV 0 20 (default) LDDV 0 fault)	lefault)	DT H 1 DT H	00.00	<u>M(</u> 0 0 0
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve Worker Trips Ve S.1.3 Demolition	ing Truck Caj ing Truck Rot Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 1 haust Emission rial Saws Com VOC 0.0336 ozers Composi	pacity (yd ³) und Trip Control LDGT 0 ip Commut e (%) LDGT 50.00 ssion Factors (1 posite SO _x 0.0006	e (mile): HDGV 0 e (mile): HDGV 0 r(s) b/hour) (de NOx	ile): 20 (c LDDV 0 20 (default) LDDV 0 fault) CO	lefault)	DT H 1 DT H PM 2.5	00.00	МС 0 МС 0
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve Worker Trips Ve S.1.3 Demolition	ing Truck Caj ing Truck Rot Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 1 haust Emission rial Saws Com VOC 0.0336 ozers Composi	pacity (yd ³) und Trip C Ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Factos n Factors (1 posite SO _x 0.0006 ite	ommute (m HDGV 0 e (mile): HDGV 0 r(s) b/hour) (de NO _x 0.2470	ile): 20 (c LDDV 0 20 (default) 20 (default) 10 10 10 10 10 10 10 10 10 10	lefault)	DT H 1 DT H PM 2.5 0.0093	00.00 DDV 0 CH4 0.0030	MC 0 MC 0 Sec. 58.3
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve Units Average Work Solution Solution Construction Exl Concrete/Industr Emission Factors Rubber Tired Do	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 I n Phase Emission rial Saws Com VOC 0.0336 pzers Composi VOC 0.1671 s/Backhoes Co	pacity (yd ³) und Trip Co ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Factors (Inposite SO _x 0.0006 ite SO _x 0.0024 omposite	ommute (m HDGV 0 e (mile): HDGV 0 r(s) b/hour) (de NO _x 0.2470 NO _x 1.0824	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 fault) CO 0.3705 CO 0.6620	lefault)	DT H 1 1 DT H 0T H 0.0093 1 PM 2.5 0.00418	00.00 DDV 0 CH4 0.0030 CH4 0.0150	M(0
Vehicle Exhaust Average Hauli Average Hauli Vehicle Exhaust POVs Worker Trips Average Work Worker Trips Ve Worker Trips Ve Solution Solution Construction Ext Concrete/Industr Emission Factors Rubber Tired Do Emission Factors	ing Truck Caj ing Truck Rou Vehicle Mixtu DGV I 0 ker Round Tri ehicle Mixture DGV I 50.00 I n Phase Emission rial Saws Com VOC 0.0336 pzers Composi VOC 0.1671	pacity (yd ³) und Trip Co ire (%) LDGT 0 ip Commut e (%) LDGT 50.00 ssion Factors (In posite SOx 0.0006 ite SOx 0.0006	HDGV 0 e (mile): HDGV 0 r(s) b/hour) (de NOx 0.2470 NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 fault) CO 0.3705 CO	efault)	DT H 1 0T H 0T H 0T H PM 2.5 0.0093 PM 2.5	00.00 DDV 0 CH4 0.0030 CH4	MC 0 MC

^{36 -} Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

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	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
							•		

1 2

6.1.4 Demolition Phase Formula(s)

3	
4	- Fugitive Dust Emissions per Phase
5	$PM10_{FD} = (0.00042 * BA * BH) / 2000$
6	
7	PM10 _{FD} : Fugitive Dust PM 10 Emissions (TONs)
8	0.00042: Emission Factor (lb/ft ³)
9	BA: Area of Building to be demolished (ft^2)
10	BH: Height of Building to be demolished (ft)
11	2000: Conversion Factor pounds to tons
12	
13	- Construction Exhaust Emissions per Phase
14	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
15	
16	CEE _{POL} : Construction Exhaust Emissions (TONs)
17	NE: Number of Equipment
18	WD: Number of Total Work Days (days)
19	H: Hours Worked per Day (hours)
20	EF _{POL} : Emission Factor for Pollutant (lb/hour)
21	2000: Conversion Factor pounds to tons
22	
23	- Vehicle Exhaust Emissions per Phase
24	$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$
25	
26	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
27	BA: Area of Building being demolish (ft ²)
28	BH: Height of Building being demolish (ft)
29	$(1 / 27)$: Conversion Factor cubic feet to cubic yards $(1 \text{ yd}^3 / 27 \text{ ft}^3)$
30	0.25: Volume reduction factor (material reduced by 75% to account for air space)
31	HC: Average Hauling Truck Capacity (yd ³)
32	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
33	HT: Average Hauling Truck Round Trip Commute (mile/trip)
34	
35	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
36	
37	V _{POL} : Vehicle Emissions (TONs)
38	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
39	0.002205: Conversion Factor grams to pounds
40	EF _{POL} : Emission Factor for Pollutant (grams/mile)
41	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
42	2000: Conversion Factor pounds to tons
43	
44	- Worker Trips Emissions per Phase
45	$VMT_{WT} = WD * WT * 1.25 * NE$
46	

1 VMTwr: Worker Trips Vehicle Miles Travel (miles) 2 WD: Number of Datil Work Days (days) 3 WT: Average Worker Round Trip Commute (mile) 1 1.25: Conversion Factor Number of Construction Equipment to Number of Works 6 NE: Number of Construction Equipment 7 Vred.: Vehicle Emissions (TONs) 9 Vred:: Vehicle Emissions (TONs) 10 0.002205: Conversion Factor grants to pounds 12 EFreq:: Emission Factor for Pollutant (gram/mile) 13 VMTwr: Worker Trips Vehicle Miture (%) 14 2000: Conversion Factor pounds to tons 15 6.2 Site Grading Phase 16 6.2 Site Grading Phase Timeline Assumptions 17 Start Quarter: 1 123 Start Quarter: 1 123 Start Quarter: 1 123 Start Quarter: 1 124 Vart Quarter: 1 125 Phase Duration Number of Month: 12 Number of Month: 12 17 Number of Month: 12 180 Area of Site to be Graded (ft ²): 850 391 - General Site Grading Information 302 - Site Grading Default				
3 WT: Average Worker Round Trip Commute (mile) 1 1.25: Conversion Factor Number of Construction Equipment to Number of Works 6 NE: Number of Construction Equipment 7 Vred. = (VMTwr * 0.002205 * EFred. * VM) / 2000 8 Vext: Vehicle Emissions (TONs) 10 0.002205: Conversion Factor praws to pounds 12 EFreq: Emission Factor for Pollutant (grams/mile) 13 VMTwr: Worker Trips Vehicle Mixture (%) 2000: Conversion Factor pounds to tons 16 6.2 Site Grading Phase 17 6.21 Site Grading Phase Timeline Assumptions 19 • Phase Start Date 11 Start Month: 1 12 Start Month: 1 13 Start Year: 2025 24 • Phase Duration 16 6.2.2 Site Grading Information 26 • Phase Duration 27 Number of Month: 12 18 Number of Month: 12 19 • Area of Site to be Graded (Tr); solution (Site (yd'); solution (Site (Yes) (Site Grading Default Settings 26.2.3 Site Grading Default Settings Equip	1			
4 1.25: Conversion Factor Number of Construction Equipment to Number of Works 7 NE: Number of Construction Equipment 7 Vrat.: (VMTwT * 0.002205 * EFront * VM) / 2000 9 Vrat.: Vehicle Emissions (TONs) 9 Vrat.: Vehicle Emissions (TONs) 10 VMTwT: Worker Trips Vehicle Mikture (miles) 10.002205: Conversion Factor products (Miles Travel (miles) 11 0.002205: Conversion Factor products to tons 12 EFront: Emission Factor products to tons 13 VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor products to tons 14 2000: Conversion Factor products to tons 15 6.21 Site Grading Phase Timeline Assumptions 19 • Phase Start Date 11 Start Quarter: 1 123 Start Quarter: 1 123 Start Quarter: 1 123 Start Quarter: 1 124 Number of Days: 0 13 General Site Grading Information 14 Arrea of Site to be Graded (ft'): 850451.2 15 Amount of Material to be Hauled On-Site (yd'): 85 15 Site Grading Default Settings <t< td=""><td>2</td><td>WD: Number of Total Work Days (days)</td><td></td><td></td></t<>	2	WD: Number of Total Work Days (days)		
5 NE: Number of Construction Equipment 6 $V_{PGL} = (VMT_{WT} * 0.002205 * EF_{PGL} * VM) / 2000$ 8 $V_{PGL} = (VMT_{WT} * 0.002205 * EF_{PGL} * VM) / 2000$ 9 $V_{PGL} : Vehicle Emissions (TONs)$ 10 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles) 10 0.002205 : Conversion Factor grams to pounds 12 $EF_{PGL} : Emission Factor for Pollutant (grams/mile) 13 Wit Worker Trips On Road Vehicle Misture (%) 2000: Conversion Factor pounds to tons 16 6.2 Site Grading Phase 16 6.2 Site Grading Phase Timeline Assumptions 17 Start Month: 1 21 Start Month: 12 22 Start Year: 2025 24 • Phase Duration 25 • Phase Duration 26 • C.2.2 Site Grading Information 37 - General Site Grading Information 38 - Arroa of Site to be Graded (t^2): 85 36 • Site Grading Default Settings 37 Default Settings Used: Yes 38 Average Day(s) worked per week: 5 (default) 40 • Construction Exhaust (default) 50 •$	3			
$V_{rot} = (VMT_{wr} * 0.002205 * EF_{rot} * VM) / 2000$ $V_{rot} : Vehicle Emissions (TONs)$ $V_{rot} : Worker Trips Vehicle Miles Travel (miles)$ $0.002205 : Conversion Factor produltant (grams.vnile)$ $VMT_{wr} : Worker Trips O Road Vchicle Miles Travel (miles)$ $0.002205 : Conversion Factor pounds to tons$ $6.2 Site Grading Phase$ $6.2.1 Site Grading Phase Timeline Assumptions$ $6.2 Site Grading Phase Timeline Assumptions$ $90 - Phase Start Date$ $1 Start Month: 1$ $1 Start Month: 1$ $1 Start Month: 12$ $Number of Month: 12$ $Number of Month: 12$ $Number of Month: 12$ $Number of Month: 12$ $3 Start Year: 2025$ $6.2.2 Site Grading Phase Assumptions$ $1 - General Site Grading Information$ $Area of Site to be Graded (ft2): 850451.2$ $Areage Day(s) worked per week: 5 (default)$ $2 - Construction Exhaust (default)$ $1 - Construction Exhaust (default)$ $2 - Construction Equipment Composite 1 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0$			mber of Works	
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42 43- Vehicle Exhaust Average Hauling Truck Capacity (yd³):20 (default)44 45Average Hauling Truck Round Trip Commute (mile):20 (default)	4.1	Tractors/Loaders/Backhoes Composite	3	8
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 44 Average Hauling Truck Round Trip Commute (mile): 20 (default) 45 			Soult)	
45				
		Average manning fruck Kound frip Commute (mile): 20 (del	ault)	
		- Vehicle Exhaust Vehicle Mixture (%)		
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NOVEMBER 2023

	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 7 8

8 9

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

6.2.3 Site Grading Phase Emission Factor(s)

Construction Exhaust Emission Factors (lb/hour) (default)											
Excavators Composi	ite										
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70			
Graders Composite											
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89			
Other Construction	Equipment	Composite	e								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60			
Rubber Tired Dozer	s Composit	te									
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45			
Scrapers Composite											
	VOC	SOx	NO _x	СО	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/Ba	ackhoes Co	mposite									
	VOC	SOx	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			

10 11

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

		torner in							
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

12

17

13 6.2.4 Site Grading Phase Formula(s)

1415 - Fugitive Dust Emissions per Phase

16 $PM10_{FD} = (20 * ACRE * WD) / 2000$

- 18 PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 19 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 20 ACRE: Total acres (acres)
- 21 WD: Number of Total Work Days (days)
- 22 2000: Conversion Factor pounds to tons
- 2324 Construction Exhaust Emissions per Phase

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1 2	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
3	CEE _{POL} : Construction Exhaust Emissions (TONs)
4	NE: Number of Equipment
5	WD: Number of Total Work Days (days)
6	H: Hours Worked per Day (hours)
7	EF _{POL} : Emission Factor for Pollutant (lb/hour)
8	2000: Conversion Factor pounds to tons
9	
10	- Vehicle Exhaust Emissions per Phase
11	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
12	
13	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
14	HA_{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
15	$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd ³)
16	HC: Average Hauling Truck Capacity (yd^3)
17	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
18	HT: Average Hauling Truck Round Trip Commute (mile/trip)
19	111. Average maining mack Round mit commute (mite/uip)
20	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
20	$V_{POL} = (V_{POL} + V_{POL} + V_{$
22	V _{POL} : Vehicle Emissions (TONs)
23	VMT _{ve} : Vehicle Exhaust Vehicle Miles Travel (miles)
24	0.002205: Conversion Factor grams to pounds
25	EF _{POL} : Emission Factor for Pollutant (grams/mile)
26	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
27	2000: Conversion Factor pounds to tons
28	
29	- Worker Trips Emissions per Phase
30	$VMT_{WT} = WD * WT * 1.25 * NE$
31	
32	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
33	WD: Number of Total Work Days (days)
34	WT: Average Worker Round Trip Commute (mile)
35	1.25: Conversion Factor Number of Construction Equipment to Number of Works
36	NE: Number of Construction Equipment
37	1 1
38	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
39	
40	V _{POL} : Vehicle Emissions (TONs)
41	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
42	0.002205: Conversion Factor grams to pounds
43	EF _{POL} : Emission Factor for Pollutant (grams/mile)
44	VM: Worker Trips On Road Vehicle Mixture (%)
45	2000: Conversion Factor pounds to tons
46	1
47	6.3 Trenching/Excavating Phase
48	
49	6.3.1 Trenching / Excavating Phase Timeline Assumptions
50	
51	- Phase Start Date
52	Start Month: 1
53	
	Start Ouarter: 1
54	Start Quarter: 1 Start Year: 2025

- Phase Dura										
	of Month									
Number	of Days:	0								
6.3.2 Trend	ching / Ex	cavating	Phase As	sumptions						
	0	C		-						
- General Tr					0					
			'Excavated auled On-S		0					
			auled Off-S		0 0					
Amount	UI Materi			site (yu).	0					
- Trenching	Default Se	ettings								
	Settings U		Y	les						
Average	Day(s) we	orked per	week: 5	(default)						
- Constructio	on Exhaus	· · · ·					1 0		-	D D
		Equipn	nent Name				nber O		Hours	Per Da
						Equ	ipmen	ţ į		
- Vehicle Exl	haust									
		Fruck Car	pacity (yd ³)	•	20 (č	lefault)				
0	0	-		• ommute (m		lefault)				
i i vei uge			inu inp o		IIC) 1 20 (C	ioruuri)				
- Vehicle Exl	haust Veh	icle Mixtu	re (%)		1					
			DOT	IDOIL	IDDU	LDD		HDDV	r	MC
	LDG	V L	DGT	HDGV	LDDV)]			MC
POVs - Worker Tr Average	0 ips		DG1 0 p Commut	0	20 (default)	0		100.00		0 0
- Worker Tr	0 ips Worker l ips Vehicl	Round Tri e Mixture	0 p Commut (%)	0 e (mile):	0 20 (default)	0		100.00		0
- Worker Tr Average - Worker Tr	0 ips Worker I ips Vehicl LDG	Round Tri e Mixture V L	0 p Commut (%) .DGT	0 e (mile): HDGV	0 20 (default) LDDV			100.00 HDDV		0 MC
- Worker Tr Average - Worker Tr POVs	ips Worker I ips Vehicl LDG 50.0	Round Tri e Mixture V L 0 <u></u>	0 p Commut (%) DGT 50.00	0 e (mile): HDGV 0	0 20 (default) LDDV 0	0		100.00		0
- Worker Tr Average - Worker Tr	0 ips Worker I ips Vehicl LDG 50.0 ching / Ey	Round Trie MixtureVI02xcavating	0 p Commut (%) DGT 50.00 Phase En	0 e (mile): HDGV 0 nission Fac	0 20 (default) LDDV 0 etor(s)			100.00 HDDV		0 MC
- Worker Tr Average - Worker Tr POVs 6.3.3 Trend	0 ips Worker I LDG 50.0 ching / Ex	Round Tri e Mixture V L 0 5 xcavating xt Emission te	0 p Commut (%) DGT 50.00 Phase En n Factors (1	0 e (mile): HDGV 0 nission Fac b/hour) (de	0 20 (default) LDDV 0 ctor(s) fault)	0 LDE 0	DT	100.00 HDDV 0		0 MC 0
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Excavators 	0 ips Worker I ips Vehicl LDG 50.0 ching / Ex on Exhaus Composit	Round Tri e Mixture V L 0 5 xcavating te Emission te VOC	0 p Commut (%) DGT 50.00 Phase En n Factors (I SO _x	0 e (mile): HDGV 0 nission Fac b/hour) (de	0 20 (default) 1DDV 0 2tor(s) fault) CO	0 LDE 0 PM 10	DT PM 2	100.00 HDDV 0		0 MC 0
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Excavators Emission Family 	0 ips Worker I ips Vehicl LDG 50.0 ching / Exactly ching / Exhaus Composit	Round Tri e Mixture V L 0 5 xcavating xt Emission te	0 p Commut (%) DGT 50.00 Phase En n Factors (1	0 e (mile): HDGV 0 nission Fac b/hour) (de	0 20 (default) LDDV 0 ctor(s) fault)	0 LDE 0	DT	100.00 HDDV 0		0 MC 0
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Excavators 	0 ips Worker I ips Vehicl LDG 50.0 ching / Exactly ching / Exhaus Composit	Round Trie MixtureVL05xcavatingat EmissionteVOC0.0559	0 p Commut (%) DGT 50.00 Phase En n Factors (I SOx 0.0013	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269	0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default)	0 LDI 0 PM 10 0.0086	PM 2 0.003	100.00 HDDV 0 2.5 C 36 0.0	2 H 4 0050	0 MC 0
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Excavators Emission Fa Graders Communication 	0 ips Worker I ips Vehicl LDG 50.00 ching / Ex ching / Ex composite	Round Tri e Mixture V I 0 ≤ xcavating t Emission te VOC 0.0559 VOC	0 p Commut (%) DGT 50.00 Phase En n Factors (I SO _x 0.0013 SO _x	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269 NOx	0 20 (default) 0 20 (default) 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 20 (default	0 LDE 0 PM 10 0.0086 PM 10	PM 2 0.003 PM 2	100.00 HDDV 0 2.5 C 36 0.0 2.5 C	EH4 0050 EH4	0 MC 0 119.
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Emission Fa Graders Construction Emission Fa 	0 ips Worker I ips Vehicl LDG 50.00 Ching / Ex- ching / Ex- composite mposite actors	Round Tri e Mixture V L 0 ≦ xcavating at Emission te VOC 0.0559 VOC 0.0676	0 p Commut (%) DGT 50.00 Phase En Factors (I SOx 0.0013 SOx 0.0014	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269 NOx 0.3314	0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default)	0 LDI 0 PM 10 0.0086	PM 2 0.003	100.00 HDDV 0 2.5 C 36 0.0 2.5 C	2 H 4 0050	0 MC 0 119.7
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Excavators Emission Fa Graders Communication 	0 ips Worker I ips Vehicl LDG 50.00 Ching / Ex- ching / Ex- composite mposite actors	Round Tri e Mixture V L 0 5 xcavating st Emission te VOC 0.0559 VOC 0.0676 Equipmen	0 p Commut (%) DGT 50.00 Phase En Factors (I SOx 0.0013 SOx 0.0014 t Composit	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e	0 20 (default) 0 ctor(s) fault) CO 0.5086 CO 0.5695	 0 LDE 0 0	PM 2 0.002 PM 2 0.014	HDDV 0 2.5 C 86 0.0 2.5 C 47 0.0	EH4 0050 EH4 0061	0 MC 0 119.' 132.'
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction 	0 ips Worker J ips Vehicl LDG 50.00 Ching / Ex- ching / Ex- composite actors omposite actors struction J	Round Tri e Mixture V L 0 5 xcavating xcavating t Emission te VOC 0.0559 VOC 0.0676 Equipmen VOC	0 p Commut (%) .DGT 50.00 Phase En Factors (I SOx 0.0013 SOx 0.0014 t Composit SOx	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx	0 20 (default) 0 ctor(s) fault) CO 0.5086 CO 0.5695	 0 LDE 0 0 PM 10 0.0147 PM 10 0.0147 	PM 2 0.003 PM 2 0.014 PM 2	100.00 HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C	EH4 0050 EH4 0061 EH4	0 MC 0 119. 132.4 CO2
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa 	ips Worker I ips Vehicl LDG 50.0 ching / Ex ching / Ex composite actors composite actors	Round Trie MixtureVL05scavatingtemissionVOC0.0559VOC0.0676EquipmenVOC0.0442	0 p Commut (%) .DGT 50.00 Phase En Factors (I SOx 0.0013 CON14 Composit SOx 0.0014 Composit SOx 0.0012	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e	0 20 (default) 0 ctor(s) fault) CO 0.5086 CO 0.5695	 0 LDE 0 0	PM 2 0.002 PM 2 0.014	100.00 HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C	EH4 0050 EH4 0061	0 MC 0 119. 132.4 CO2
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction 	ips Worker I ips Vehicl LDG 50.0 ching / Ex ching / Ex composite actors composite actors	Round Tri e Mixture V L 0 5 xcavating t Emission te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 5 Composi	0 p Commut (%) JDGT 50.00 Phase En n Factors (I SO _x 0.0013 SO _x 0.0014 t Composit SO _x 0.0012 te	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e NO _x 0.2021	0 20 (default) 0 20 (default) 0 2 2 0 2 2 0 5 0 5 0 8 0 2 0 5 0 8 6 0 5 0 8 6 0 5 0 8 6 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0	 0 LDE 0 0	PM 2 0.003 PM 2 0.014 PM 2 0.000	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0	EH4 0050 EH4 0061 EH4 0039	0 MC 0 119.2 132.3 CO2 122.4
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa Rubber Time 	0 ips Worker I ips Vehicl LDG 50.00 Ching / Ex composite actors omposite struction I actors red Dozers	Round Tri e Mixture V L 0 5 xcavating xcavating te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 s Composi VOC	0 p Commut (%) .DGT 50.00 Phase En Factors (I SO _x 0.0013 Composit SO _x 0.0012 te SO _x SO _x SO _x SO _x SO _x	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e NO _x 0.2021 NO _x	0 20 (default) 0 tor(s) fault) CO 0.5086 CO 0.5695 CO 0.3473 CO	 D LDI 0 0	PM 2 0.003 PM 2 0.014 PM 2 0.000 PM 2	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0 2.5 C	EH4 0050 EH4 0061 EH4 0039 EH4	0 MC 0 119. 132. CO 122.
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa Rubber Tir Emission Fa 	ips Worker I ips Vehicl LDG 50.00 ching / Ex ching / Ex composite actors mposite actors struction I actors struction I actors	Round Tri e Mixture V L 0 5 xcavating t Emission te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 5 Composi	0 p Commut (%) JDGT 50.00 Phase En n Factors (I SO _x 0.0013 SO _x 0.0014 t Composit SO _x 0.0012 te	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e NO _x 0.2021	0 20 (default) 0 20 (default) 0 2 2 0 2 2 0 5 0 5 0 8 0 2 0 5 0 8 6 0 5 0 8 6 0 5 0 8 6 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0	 0 LDE 0 0	PM 2 0.003 PM 2 0.014 PM 2 0.000	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0 2.5 C	EH4 0050 EH4 0061 EH4 0039	0 MC 0 119. 132.3 CO: 122.4
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa Rubber Time 	ips Worker I ips Vehicl LDG 50.00 ching / Ex ching / Ex composite actors mposite actors struction I actors struction I actors	Round Tri e Mixture V L 0 5 xcavating xcavating te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 s Composi VOC	0 p Commut (%) .DGT 50.00 Phase En Factors (I SO _x 0.0013 Composit SO _x 0.0012 te SO _x SO _x SO _x SO _x SO _x	0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e NO _x 0.2021 NO _x	0 20 (default) 0 tor(s) fault) CO 0.5086 CO 0.5695 CO 0.3473 CO	 D LDI 0 0	PM 2 0.003 PM 2 0.014 PM 2 0.000 PM 2	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0 2.5 C 100.00 100.00	EH4 0050 EH4 0061 EH4 0039 EH4	0 MC 0 119.7 132.3 CO: 132.4 CO: 239.4
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa Scrapers Construction Emission Fa 	0 ips Worker I ips Vehicl LDG 50.00 ching / Ex on Exhaus composite actors struction I actors actors omposite actors actors	Round Tri e Mixture V L 0 5 xcavating xt Emission te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 S Composi VOC 0.1671 VOC 0.1495	0 p Commut (%) .DGT 50.00 Phase En Factors (I SOx 0.0013 Composit SOx 0.0014 t Composit SOx 0.0012 te SOx 0.0024 SOx 0.0024	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021 NOx 1.0824	0 20 (default) 0 20 (default) 0 2 cor(s) fault) CO 0.5086 CO 0.5695 CO 0.3473 CO 0.6620	● 0 ■ LDF 0 0 0 0 0 0 0 0 0 0 0 0 0	PM 2 0.003 PM 2 0.014 PM 2 0.004	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0 2.5 C 58 0.0 2.5 C 2.5 C 2.5 C 2.5 C 2.5 C 2.5 C	EH4 0050 EH4 0061 EH4 0039 EH4 0150	0 MC
 Worker Tr Average Worker Tr POVs 6.3.3 Trend Construction Construction Emission Fa Graders Construction Emission Fa Other Construction Emission Fa Rubber Tim Emission Fa 	0 ips Worker I ips Vehicl LDG 50.00 ching / Ex on Exhaus composite actors struction I actors actors omposite actors actors	Round Tri e Mixture V L 0 5 xcavating xt Emission te VOC 0.0559 VOC 0.0676 Equipmen VOC 0.0442 S Composi VOC 0.1671 VOC 0.1495	0 p Commut (%) .DGT 50.00 Phase En Factors (I SOx 0.0013 Composit SOx 0.0014 t Composit SOx 0.0012 te SOx 0.0024 SOx 0.0024	0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021 NOx 1.0824	0 20 (default) 0 20 (default) 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0	 0 LDE 0 	PM 2 0.002 PM 2 0.014 PM 2 0.000 PM 2 0.04 PM 2	HDDV 0 2.5 C 36 0.0 2.5 C 47 0.0 2.5 C 58 0.0 2.5 C 58 0.0 2.5 C 2.5 C 2.5 C 2.5 C 2.5 C 2.5 C	EH4 0050 EH4 0061 EH4 0039 EH4 0150 EH4 0150 EH4	0 MC 0 119.7 132.8 CO ₂ 132.8 CO ₂ 239.4 CO ₂

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

3

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

36 37

43

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

- Construction Exhaust Emissions per Phase

- $5 \quad CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
 - CEE_{POL}: Construction Exhaust Emissions (TONs)
- 9 NE: Number of Equipment
- 0 WD: Number of Total Work Days (days)
- H: Hours Worked per Day (hours)
- 2 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 3 2000: Conversion Factor pounds to tons

5 - 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 (yd³)
 - HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
- HC: Average Hauling Truck Capacity (yd³)
- 2 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
- HT: Average Hauling Truck Round Trip Commute (mile/trip)
- 35 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
 - V_{POL}: Vehicle Emissions (TONs)
- 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
- 39 0.002205: Conversion Factor grams to pounds
- 40 EF_{POL}: Emission Factor for Pollutant (grams/mile)
- 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%)
- 42 2000: Conversion Factor pounds to tons
- 44 Worker Trips Emissions per Phase
- 45 $VMT_{WT} = WD * WT * 1.25 * NE$

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1	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
2	WD: Number of Total Work Days (days)		
3	WT: Average Worker Round Trip Commute (mile)		
4	1.25: Conversion Factor Number of Construction Equipment to Num	mber of Works	
5	NE: Number of Construction Equipment		
6 7	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
8	V Valiala Emissions (TONs)		
9 10	V _{POL} : Vehicle Emissions (TONs) VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)		
10	0.002205: Conversion Factor grams to pounds		
12	EF_{POL} : Emission Factor for Pollutant (grams/mile)		
13	VM: Worker Trips On Road Vehicle Mixture (%)		
14	2000: Conversion Factor pounds to tons		
15			
16 17	6.4 Building Construction Phase		
18 19	6.4.1 Building Construction Phase Timeline Assumptions		
20	- Phase Start Date		
21	Start Month: 1		
22	Start Quarter: 1		
23	Start Year: 2025		
24			
25 26	- Phase Duration Number of Month: 12		
20 27	Number of Days: 0		
28	Number of Days.		
29	6.4.2 Building Construction Phase Assumptions		
30	o i		
31	- General Building Construction Information		
32	Building Category: Office or Industrial		
33	Area of Building (ft ²): 735632		
34	Height of Building (ft): 25		
35 36	Number of Units: N/A		
30 37	- Building Construction Default Settings		
38	Default Settings Used: Yes		
39	Average Day(s) worked per week: 5 (default)		
40			
41	- 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
40	Welders Composite	1	8
42 43	- Vehicle Exhaust		
44	Average Hauling Truck Round Trip Commute (mile): 20 (def	ault)	
45 46	- Vehicle Exhaust Vehicle Mixture (%)		
-10	LDGV LDGT HDGV LDDV	LDDT HI	DDV MC

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POVs	0	0	0	0	0	100.00	0

1 2 3

4 5

6 7

8

9 10 - Worker Trips Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

11 12

6.4.3 Building Construction Phase Emission Factor(s)

13 14

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

Cranes Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77	
Forklifts Composite									
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e	
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449	
Generator Sets Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057	
Tractors/Loaders/Ba	ackhoes Co	mposite							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872	
Welders Composite	Welders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650	

15 16

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

	(Standy Market 11 PS Zambbioli 1 actors (Standy mine)									
	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	

17

18 **6.4.4 Building Construction Phase Formula(s)**

19

20 - Construction Exhaust Emissions per Phase

- 21 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 2223 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 24 NE: Number of Equipment
- 25 WD: Number of Total Work Days (days)
- 26 H: Hours Worked per Day (hours)

EFroil:Emission Factor for Pollutant (lb/hour)2000:Conversion Factor pounds to tonsVMTyne = BA * BH * (0.42 / 1000) * HT-VMTyne = BA * BH * (0.42 / 1000) * HT-VMTyne = BA * BH * (0.42 / 1000) * HT-VMTyne = A * BH * (0.42 / 1000) * HT-VMTyne = A * BH * (0.42 / 1000) * Conversion Factor ft to trips (0.42 trip / 1000 ft*)-BH: Height of Building (ft*)-(0.42 / 1000):-Conversion Factor ft* to trips (0.42 trip / 1000 ft*)-HT: Average Hauling Truck Round Trip Commute (mile/trip)-VroL = (VMTyre * 0.002205 * EFroL * VM) / 2000-VroL = (VMTyre * 0.002205 * EFroL * VM) / 2000-VroL : Vehicle Emissions (TONS)-VMTyre: Vehicle Exhaust Vehicle Miles Travel (miles)0.002205:Conversion Factor pounds to tons-EFroa: Emissions per Phase-VMTwr: Worker Trips Vehicle Miles Travel (miles)-Worker Trips Vehicle Mules Travel (miles)-VroL = (VMTyrt * 0.002205 * EFroL * VM / 2000-VroL = (WMTyrt * 0.002205 * EFroL * VM / 2000-VroL = (WMTyrt * 0.002205 * EFroL * VM / 2000-VroL = Emissions per Phase-VMTyre: Vehicle Emissions (TONs) <tr< th=""><th>B-140</th><th>NOVEMBER 2023</th></tr<>	B-140	NOVEMBER 2023
2000: Conversion Factor pounds to tons • Vehicle Exhaust Emissions per Phase VMT $_{VR} = BA * BH * (0.42 / 1000) * HT VMT_{VR} = BA * BH * (0.42 / 1000) * HT VMT_{VR} = BA * BH * (0.42 / 1000) * HT VMT_{VR}: Vehicle Exhaust Vehicle Miles Travel (miles)BA: Area of Building (ft)(0.42 / 1000): Conversion Factor ft3 to trips (0.42 trip / 1000 ft3)HT: Average Hauling Truck Round Trip Commute (mile/trip)VroL = (VMT_{VR} * 0.002205 * EF_{PoL} * VM) / 2000VroL = (VMT_{VR} * 0.002205 * EF_{PoL} * VM) / 2000 VroL : Vehicle Emissions (TONs) VMT_{VR} : Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{PoL} : Emission Factor for Pollutant (grams/mile) VX: Worker Trips On Road Vehicle Mikure (%s) 2000: Conversion Factor pounds to tons - Worker Trips Emissions per Phase VMT_{WT} : Worker Trips Vehicle Miles Travel (miles) WD: Number of Total Work Days (days) WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor Multise Travel (miles) WD: Number of Construction Equipment VroL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000VroL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000VroL : Vehicle Emissions per PhaseVMT_{WT} : Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor for 90lutant (grams/mile) VroL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000-Vender Trips Emissions per PhaseVMT_{WT} : Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor for 90lutant (grams/mile) VK: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor for 90lutant (grams/mile) VMT_{WT} : Worker Trips OR 0.002005 * EF_{POL} * VM) / 2000-Vender Trips Emissions per PhaseVMT_{VT} : Vender Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor for 90lutant (grams/mile) VMT_{VT} : Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor for 90lutant (grams/mile) VMT_{VT} : Vender Trips Vehicle Miles Travel (miles) BA: Area of Building (ft) (0.38 / 1000): Con$	1	
• Vehicle Exhaust Emissions per PhaseVMTv _E = BA * BH * (0.42 / 1000) * HTVMTv _E : Vehicle Exhaust Vehicle Miles Travel (miles)BA: Area of Building (ft)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)VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _E * 0.002205 * EFroL * VM) / 2000VMTw _E : Vehicle Exhaust Vehicle Miles Travel (miles)0.002205: Conversion Factor grams to poundsEFrol: Emissions factor Pollutant (grams/mile)VX: Worker Trips On Road Vehicle Miles Travel (miles)VMTw _T = WD * WT * 1.25 * NEVMTw _T = WO* WT * 1.25 * NEVMTw _T : 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 EquipmentVroL = (VMTv _T * 0.002205 * EFroL * VM) / 2000VroL = (VMTv _T * 0.002205 * EFroL * VM) / 2000VroL: Vehicle Emissions (TONs)VMTVr: Worker Trips On Road Vehicle Miles Travel (miles)0.002205: Conversion Factor grams to poundsEFroN: Emissions Factor for Pollutant (grams/mile)VMTv _T : Worker Trips On Road Vehicle Misure (%)2000: Conversion Factor for pollutant (grams/mile)VMTv		
4• Vehicle Exhanst Emissions per Phase5 $VMT_{VRE} = BA * BH * (0.42 / 1000) * HT7VMT_{VRE}: Vehicle Exhaust Vehicle Miles Travel (miles)8BA: Area of Building (ft?)9BH: Height of Building (ft)10(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)11HT: Average Hauling Truck Round Trip Commute (mile/trip)12V_{FOL} = (VMT_{VE} * 0.002205 * EF_{FOL} * VM) / 200014V_{FOL} = (VMT_{VE} * 0.002205 * EF_{FOL} * VM) / 200015V_{FOL} : Vehicle Exhaust Vehicle Miles Travel (miles)100.002205: Conversion Factor grams to pounds16EFroa: Emission Factor for Pollutant (grams/mile)17Vorker Trips Emissions per Phase18VMT_WT: Worker Trips Vehicle Miles Travel (miles)2000: Conversion Factor pounds to tons21VMT_WT: Worker Trips Vehicle Miles Travel (miles)23VMT_WT: Worker Trips Vehicle Miles Travel (miles)24VMT_WT: Worker Trips Vehicle Miles Travel (miles)25VMT_WT: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor grams to pounds29VPoL: Vehicle Emissions (TONs)30VPoL: Vehicle Emissions (TONs)31VPoL = (VMT_{VT} * 0.002205 * EF_FOL * VM) / 200032VpoL: Vehicle Emission factor fravel (miles)330.002205: Conversion Factor grams to pounds34CMT_{VT} = BA * BH * (0.38 / 1000) * HT<$		2000. Conversion Factor pounds to tons
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$ $VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles) BA: Area of Building (ft2) BH: Height of Building (ft2) (0.42 / 1000): Conversion Factor ft3 to trips (0.42 trip / 1000 ft3) HT: Average Hauling Truck Round Trip Commute (mile/trip) V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} : Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor for Pollutant (grams/mile) VMT we: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VMT we: Vehicle Exhaust Vehicle Miles Travel (miles) VMT were Trips On Road Vehicle Miles Travel (miles) VMT were Trips Emissions per Phase VMTwr = WD * WT * 1.25 * NE VMTwr = WD * WT * 1.25 * NE VMTwr: Worker Trips Vehicle Miles Travel (miles) WD: Number of Total Work Days (days) WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor Number of Construction Equipment to Number of Works NE: Number of Construction Equipment VFoL = (VMTWT * 0.002205 * EF_{POL} * VM) / 2000 Vort: Vehicle Emissions (TONs) VMTwr: Worker Trips Vehicle Miles Travel (miles) VMTwr: Worker Trips Vehicle Miles Travel (miles) VFoL = (VMTWT * 0.002205 * EF_{POL} * VM) / 2000 Vrot: Vehicle Emissions (TONs) VMTwr: Worker Trips On Road Vehicle Miles Travel (miles) OU00: Conversion Factor pounds to tons VMTwr: Worker Trips On Road Vehicle Miles Travel (miles) VMTwr: Worker Trips On Road Vehicle Miles Travel (miles) VMTwr: Worker Trips On Road Vehicle Miles Travel (miles) VMTwr = BA * BH * (0.38 / 1000) * HT VMTvr: BA * BH * (0.38 / 1000) * HT VMTvr: Vender Trips Vehicle Miles Travel (miles) H: Height of Building (ft) (0.38 / 1000): Conversion Factor ft3 to trips (0.38 trip / 1000 ft3) HT: Average Hauling Truck Round Trip Commute (mile/trip) Vrot, = (VMTvr * 0.002205 * EF_{POL} * VM) / 2000$		Vahiala Exhaust Emissions nor Dhasa
6VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)8BA: Area of Building (ft)9BH: Height of Building (ft)10(0.42 / 1000): Conversion Factor ft ³ to trips (0.42 trip / 1000 ft ³)11HT: Average Hauling Truck Round Trip Commute (mile/trip)12VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200013VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200014VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 200015VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)16VJMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)170.002205: Conversion Factor grams to pounds18EFFOL: Emission Factor for Pollutant (grams/mile)19VJM: Worker Trips Emissions per Phase2000: Conversion Factor pounds to tons21• Worker Trips Emissions per Phase23VMTwT: Worker Trips Vehicle Miles Travel (miles)24WD: Number of Total Work Days (days)25VMTwT: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Construction Equipment to Number of Works27WFOL = (VMTwT * 0.002205 * EFFOL * VM) / 200028VFOL = (VMTwT * 0.002205 * EFFOL * VM) / 200029Vmore: Trips On Road Vehicle Miles Travel (miles)300.002205: Conversion Factor grams to pounds31VFOL = (VMTwT * 0.002205 * EFFOL * VM) / 200032Vend: Trips On Road Vehicle Miles Travel (miles)33Outroersion Factor for Pollutant (grams/mile)34VMTvT: Norker Trips On Road Vehicle Miles Travel (miles)352000: Conversion		
7VMT v_E : Vchicle Exhaust Vchicle Miles Travel (miles)8BA: Area of Building (ft)9BH: Height of Building (ft)10(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)11HT: Average Hauling Truck Round Trip Commute (mile/trip)1213VPoL = (VMT v_E * 0.002205 * EFPoL * VM) / 20001415VpoL = (VMT v_E * 0.002205 * EFPoL * VM) / 200016VFoL: Vehicle Emissions (TONs)170.002205: Conversion Factor grams to pounds18EFPoL: Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Milter (%)2000: Conversion Factor pounds to tons1122• Worker Trips Emissions per Phase23VMT w_T = WD * WT * 1.25 * NE2425VMT w_T = WD * WT * 1.25 * NE26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment30VPoL = (VMT w_T * 0.002205 * EFPoL * VM) / 200031VPoL = (VMT w_T * 0.002205 * EFPoL * VM) / 200032VPoL: Vehicle Emissions (TONs)34VMT v_T : Worker Trips On Road Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPoL: Emission Factor pronulas to tons37VMT v_T : Reader grams for Phase38VMT v_T : Emission Factor for Pollutant (grams/mile)39 <td></td> <td>$V_{\rm M1}V_{\rm E} = DA D11 (0.427, 1000) 111$</td>		$V_{\rm M1}V_{\rm E} = DA D11 (0.427, 1000) 111$
8BA: Area of Building (ft²)9BH: Height of Building (ft)10(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)11HT: Average Hauling Truck Round Trip Commute (mile/trip)12 $V_{PoL} = (VMTv_E * 0.002205 * EF_{PoL} * VM) / 200014V_{PoL} = (VMTv_E * 0.002205 * EF_{PoL} * VM) / 200015V_{PoL} : Vehicle Exhaust Vehicle Miles Travel (miles)16VMTv_E: Vehicle Exhaust Vehicle Miles Travel (miles)170.002205: Conversion Factor grams to pounds18EF_{PoL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21• Worker Trips Emissions per Phase23VMTwr = WD * WT * 1.25 * NE24VMTwr: Worker Trips Vehicle Miles Travel (miles)25VMTwr: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment20VPoL = (VMTwr * 0.002205 * EFPOL * VM) / 200023VPoL : Vehicle Emissions (TONs)34VMTwr: Worker Trips On Road Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPoL: Emission Factor for Pollutant (grams/mile)37VM: Worker Trips On Road Vehicle Miles Travel (miles)382000: Conversion Factor grams to pounds39• Vender Tr$		VMTvr: Vehicle Exhaust Vehicle Miles Travel (miles)
9BH: Height of Building (ft)10 $(0.42/1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$ 11HT: Average Hauling Truck Round Trip Commute (mile/trip)12Vrot = (VMTvE * 0.002205 * EFrot * VM) / 200013Vrot : Vehicle Emissions (TONs)14Vrot: Vehicle Emissions (TONs)15Vrot: Conversion Factor grams to pounds16EFrot: Emission Factor for Pollutant (grams/mile)170.002205: Conversion Factor pounds to tons18EFrot: Emissions per Phase2000: Conversion Factor pounds to tons19VMTwr = WD * WT * 1.25 * NE20VMTwr: Worker Trips Vehicle Miles Travel (miles)2001: Conversion Factor Number of Construction Equipment to Number of Works21VMTwr: Worker Trips Vehicle Miles Travel (miles)22VMTwr: Worker Round Trip Commute (mile)231.25: Conversion Factor Number of Construction Equipment to Number of Works24VPOL = (VMTwr * 0.002205 * EFrot * VM) / 200025Vrot: Vehicle Emissions (TONs)26VMTwr: Worker Trips On Road Vehicle Miles Travel (miles)270.002205: Conversion Factor grams to pounds28EFrot: Emissions factor grams to pounds29Vent: Vehicle Emissions (TONs)2001: Conversion Factor grams to pounds2002: Conversion Factor grams to pounds2003: Conversion Factor grams to pounds2004: Conversion Factor grams to pounds2005: Conversion Factor frams to pounds2006: Conversion Factor frams (miles)2007: Conversion Factor fr		
10 $(0.42 / 100)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$ 11HT: Average Hauling Truck Round Trip Commute (mile/trip)1213 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 1415 V_{POL} : Vehicle Emissions (TONs)16 VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)17 0.002205 : Conversion Factor grams to pounds18 EF_{POL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21 •Worker Trips Emissions per Phase 24VMT_{wT} = WD * WT * 1.25 * NE25VMT_{wT}: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NPoL = (VMT_{WT} * 0.002205 * EFPoL * VM) / 200020VPoL = (VMT_WT * 0.002205 * EFPoL * VM) / 200021VPoL: Vehicle Emissions (TONs)24VMT_WT: Worker Trips Vehicle Miles Travel (miles)300.002205: Conversion Factor grams to pounds31VPoL: Emissions per Phase42VMT_WT: Worker Trips Vehicle Miles Travel (miles)33VPoL: E(MTWT Trips Vehicle Miles Travel (miles)34VMT_WT: Worker Trips No Road Vehicle Mixture (%)350.002205: Conversion Factor grams to pounds36EFPoL: Emissions per Phase41VMT_WT: Vender Trips Vehicle Miles Travel (m		
11HT: Average Hauling Truck Round Trip Commute (mile/trip)121314151617181819191010101111121213141515161718181919191010111112121415151616171818191910111111111211121212131414151515161617171818191919111112111212131415151616171718181919191011111212131415 <td< td=""><td></td><td></td></td<>		
$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ $VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205 : Conversion Factor grams to pounds EF_{POL} : Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons VMT_{WT} = WD * WT * 1.25 * NE VMT_{WT} = WD * WT * 1.25 * NE VMT_{WT} = WD * WT * 1.25 * NE VMT_{WT} = WD * WT * 1.25 * NE VMT_{WT} = VO * WT * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 V_{FOL} = VMT_{WT} = Nactor For Pollutant (grams/mile) VMT_{WT} = WD * WT * 1.25 * NE VMT_{WT} = VD * WT * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{WT} * 0.002005 * EF_{POL} * VM) / 2000 V_{FOL} = VMT_{WT} = Sactor Pollutant (grams/mile) VMT_{WT} = VOR * Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL} : Emissions per Phase VMT_{WT} : Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons VMT_{WT} = BA * BH * (0.38 / 1000) * HT VMT_{VT} = BA * BH * (0.38 / 1000) * HT V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000 V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000 * UMT_{VT}$		
14VFOL: Vehicle Emissions (TONs)15VMTVE: Vehicle Exhaust Vehicle Miles Travel (miles)16VMTVB: Vehicle Exhaust Vehicle Miles Travel (miles)170.002205: Conversion Factor grams to pounds18 EF_{POL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21- Worker Trips Emissions per Phase22VMTwT: Worker Trips Vehicle Miles Travel (miles)23VMTwT: Worker Trips Vehicle Miles Travel (miles)24WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment30VPOL = (VMTWT * 0.002205 * EFPOL * VM) / 200033VFOL: Vehicle Emissions (TONs)34VMTWT: Worker Trips Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPOL: Worker Trips On Road Vehicle Mixture (%)3000: Conversion Factor pounds to tons31VMTWT: Worker Trips On Road Vehicle Mixture (%)32000: Conversion Factor pounds to tons34VMTVT: Vender Trips Phase45VMTVT: Vender Trips Phase46VMTVT: Vender Trips Vehicle Miles Travel (miles)47VMTVT: Vender Trips Vehicle Miles Travel (miles)48BA: Area of Building (ft ²)49VPOL = (VMTVT * 0.002205 * EFPOL * VM) / 200040VPOL = (VMTVT * 0.002205 * EFPOL * VM) / 2000<		
15 V_{POL} : Vehicle Emissions (TONs)16 VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)17 0.002205 : Conversion Factor grams to pounds18 EF_{POL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21- Worker Trips Emissions per Phase23VMT _{WT} = WD * WT * 1.25 * NE24VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)25VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment30VPOL = (VMT _{WT} * 0.002205 * EFPOL * VM) / 200033VPOL : Vehicle Emissions (TONs)34VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPOL: Emission Factor prame to tons37VM: Worker Trips On Road Vehicle Mixture (%)382000: Conversion Factor prounds to tons39• Vender Trips Emissions per Phase40• Vender Trips Emissions per Phase41VMT _{VT} = BA * BH * (0.38 / 1000) * HT42VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)44BA: Area of Building (ft ²)45BH: Height of Building (ft ²)46G(.38 / 1000): Conversion Factor fravel (miles)47BA: Area of Building (ft ²) <t< td=""><td>13</td><td>$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$</td></t<>	13	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
16VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)17 0.002205 : Conversion Factor grams to pounds18 EF_{POL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21- Worker Trips Emissions per Phase22VMTwT = WD * WT * 1.25 * NE2425VMTwT: Worker Trips Vehicle Miles Travel (miles)26WD : Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment30VPOL = (VMTwT * 0.002205 * EFPOL * VM) / 200031VPOL : Vehicle Emissions (TONs)34VMTwT: Worker Trips Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPOL: Emission Factor for Pollutant (grams/mile)37VM: Worker Trips On Road Vehicle Mixture (%)382000: Conversion Factor pounds to tons39- Vender Trips Emissions per Phase41VMTvT: Vender Trips Vehicle Miles Travel (miles)420.38 / 1000) * HT43VMTvT: Vender Trips Vehicle Miles Travel (miles)440.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)45H: Height of Building (ft)460.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)47HT: Average Hauling Truck Round Trip Commute (mile/trip)48VPOL = (VMTvT * 0.002205	14	
17 0.002205 : Conversion Factor grams to pounds18 EF_{POL} : Emission Factor for Pollutant (grams/mile)19VM: Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons21- Worker Trips Emissions per Phase22VMTwT = WD * WT * 1.25 * NE24VMTwT = WD * WT * 1.25 * NE25VMTwT = Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)281.25: Conversion Factor Number of Construction Equipment to Number of Works29NE: Number of Construction Equipment30VPOL = (VMTwT * 0.002205 * EFPOL * VM) / 200031VPOL = (VMTwT rrips Vehicle Miles Travel (miles)330.002205: Conversion Factor grams to pounds34VMTwT: Worker Trips Vehicle Miles Travel (miles)350.002205: Conversion Factor grams to pounds36EFPoL: Emission Factor for Pollutant (grams/mile)37VM: Worker Trips On Road Vehicle Mixture (%)3000: Conversion Factor pounds to tons39- Vender Trips Emissions per Phase41VMTvT: Vender Trips Vehicle Miles Travel (miles)42MTVTr: Vender Trips Vehicle Miles Travel (miles)43VMTvT: Vender Trips Vehicle Miles Travel (miles)440.38 / 1000) * HT45BH: Height of Building (ft')46G(.38 / 1000): Conversion Factor ff to trips (0.38 trip / 1000 ft df)47HT: Average Hauling Truck Round Trip Commute (mile/trip)48VPOL = (VMTvT	15	V _{POL} : Vehicle Emissions (TONs)
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48 49 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 50		
49 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 50		n1. Average nauning fruck kound frip Commute (mile/trip)
50		$V_{POL} = (VMT_{VT} * 0.002205 * FE_{POL} * VM) / 2000$
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51 VPor: Vehicle Emissions (TONs)	51	V _{POL} : Vehicle Emissions (TONs)
52 VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)		
53 0.002205: Conversion Factor grams to pounds		
54 EF _{POL} : Emission Factor for Pollutant (grams/mile)		
55 VM: Worker Trips On Road Vehicle Mixture (%)		

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1
         2000: Conversion Factor pounds to tons
 2
 3
      6.5 Architectural Coatings Phase
 4
 5
      6.5.1 Architectural Coatings Phase Timeline Assumptions
 6
 7
      - Phase Start Date
 8
         Start Month:
                         7
 9
         Start Ouarter: 1
10
         Start Year:
                         2025
11
12
      - Phase Duration
13
         Number of Month: 6
14
         Number of Days:
                             0
15
16
      6.5.2 Architectural Coatings Phase Assumptions
17
18
      - General Architectural Coatings Information
19
          Building Category:
                                 Non-Residential
20
          Total Square Footage (ft<sup>2</sup>): 735632
21
         Number of Units:
                                 N/A
22
23
      - Architectural Coatings Default Settings
24
         Default Settings Used:
                                            Yes
25
          Average Day(s) worked per week:
                                            5 (default)
26
27
      - Worker Trips
28
          Average Worker Round Trip Commute (mile):
                                                        20 (default)
29
30
      - Worker Trips Vehicle Mixture (%)
                                              HDGV
                     LDGV
                                  LDGT
                                                           LDDV
                                                                        LDDT
      POVs
                      50.00
                                  50.00
                                                 0
                                                             0
                                                                          0
31
32
      6.5.3 Architectural Coatings Phase Emission Factor(s)
33
34
      - Worker Trips Emission Factors (grams/mile)
                                      NO. CO PM 10 PM 2.5 Ph NH<sub>2</sub>
               VOC SO.
```

	VUC	SU _x	NUx		PNI IU	PIM 2.5	PD	INH3	$\mathbf{CO}_2\mathbf{e}$
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

40

6.5.4 Architectural Coatings Phase Formula(s)

38 - Worker Trips Emissions per Phase

39 $VMT_{WT} = (1 * WT * PA) / 800$

41 VMT _{WT} : Worker Trips Vehicle Miles Tra	ravel (miles)
---	---------------

- 42 1: Conversion Factor man days to trips (1 trip / 1 man * day)
- 43 WT: Average Worker Round Trip Commute (mile)
- 44 PA: Paint Area (ft²)

HDDV

0

MC

0

CO.a

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1	800: Conversion Factor square feet to man days ($1 \text{ ft}^2 / 1 \text{ man } * \text{ d}$	ay)	
2		5,	
3	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
4 5	V _{POL} : Vehicle Emissions (TONs)		
6	VMT _{wr} : Worker Trips Vehicle Miles Travel (miles)		
7	0.002205: Conversion Factor grams to pounds		
8	EF _{POL} : Emission Factor for Pollutant (grams/mile)		
9	VM: Worker Trips On Road Vehicle Mixture (%)		
10	2000: Conversion Factor pounds to tons		
11 12	Off Cascing Emissions non Phase		
12	- Off-Gassing Emissions per Phase VOC _{AC} = (AB $\approx 2.0 \approx 0.0116$) / 2000.0		
13	VOCAC = (III) 2.0 0.0110) / 2000.0		
15	VOC _{AC} : Architectural Coating VOC Emissions (TONs)		
16	BA: Area of Building (ft ²)		
17	2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area	a / total area)	
18	0.0116: Emission Factor (lb/ft ²)		
19 20	2000: Conversion Factor pounds to tons		
20	6.6 Paving Phase		
22			
23	6.6.1 Paving Phase Timeline Assumptions		
24			
25	- Phase Start Date		
26	Start Month: 1		
27 28	Start Quarter: 1 Start Year: 2025		
28 29	Start rear. 2025		
30	- Phase Duration		
31	Number of Month: 12		
32	Number of Days: 0		
33	(() Dering Dhass Assumptions		
34 35	6.6.2 Paving Phase Assumptions		
36	- General Paving Information		
37	Paving Area (ft^2): 95691		
38			
39	- Paving Default Settings		
40	Default Settings Used: Yes		
41 42	Average Day(s) worked per week: 5 (default)		
42	- Construction Exhaust (default)		
	Equipment Name	Number Of	Hours Per Day
	· ·	Equipment	
	Cement and Mortar Mixers Composite	4	6
	Pavers Composite	1	7
	Paving Equipment Composite Rollers Composite	2	6 7
	Tractors/Loaders/Backhoes Composite	1	7
44	The star Boundary Buckhood Composite	1	,
45	- Vehicle Exhaust		
46	Average Hauling Truck Round Trip Commute (mile): 20 (de	fault)	
47			

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1

2 3

4

5 6

- Vehicl	e 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 (%)

6.6.3 Paving Phase Emission Factor(s)

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

7 8 9

9 10

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

Excavators Composite

Excavators Compos	ite										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70			
Graders Composite											
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89			
Other Construction	Equipment	t Composite	e								
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60			
Rubber Tired Dozen	s Composit	te									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45			
Scrapers Composite	!										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e			
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81			
Tractors/Loaders/Ba	Tractors/Loaders/Backhoes Composite										
	VOC	SOx	NOx	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			

11 12

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	Pb	\mathbf{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

13

14 **6.6.4 Paving Phase Formula(s)**

- 15
- 16 Construction Exhaust Emissions per Phase
- 17 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18
- 19 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 20 NE: Number of Equipment
- 21 WD: Number of Total Work Days (days)
- 22 H: Hours Worked per Day (hours)
- 23 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 24 2000: Conversion Factor pounds to tons

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1	- Vehicle Exhaust Emissions per Phase
2	$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$
3	
4	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
5	PA: Paving Area (ft ²)
6	0.25: Thickness of Paving Area (ft)
7	$(1 / 27)$: Conversion Factor cubic feet to cubic yards $(1 \text{ yd}^3 / 27 \text{ ft}^3)$
8	HC: Average Hauling Truck Capacity (yd ³)
9	$(1 / \text{HC})$: Conversion Factor cubic yards to trips $(1 \text{ trip} / \text{HC yd}^3)$
10	HT: Average Hauling Truck Round Trip Commute (mile/trip)
11	
12	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
13	$\mathbf{V} = \mathbf{V} 1 1 1 \mathbf{F} \mathbf{n} 1 \mathbf{n} \mathbf{T} \mathbf{O} \mathbf{V}$
14	V _{POL} : Vehicle Emissions (TONs)
15	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
16 17	0.002205: Conversion Factor grams to pounds EF _{POL} : Emission Factor for Pollutant (grams/mile)
18	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
19	2000: Conversion Factor pounds to tons
20	2000. Conversion ractor pounds to tons
21	- Worker Trips Emissions per Phase
22	$VMT_{WT} = WD * WT * 1.25 * NE$
23	
24	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
25	WD: Number of Total Work Days (days)
26	WT: Average Worker Round Trip Commute (mile)
27	1.25: Conversion Factor Number of Construction Equipment to Number of Works
28	NE: Number of Construction Equipment
29	
30	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
31 32	V Vahiala Emissions (TONa)
32 33	V _{POL} : Vehicle Emissions (TONs) VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)
33 34	0.002205: Conversion Factor grams to pounds
35	EF _{POL} : Emission Factor for Pollutant (grams/mile)
36	VM: Worker Trips On Road Vehicle Mixture (%)
37	2000: Conversion Factor pounds to tons
38	I
39	- Off-Gassing Emissions per Phase
40	$VOC_P = (2.62 * PA) / 43560$
41	
42	VOC _P : Paving VOC Emissions (TONs)
43	2.62: Emission Factor (lb/acre)
44	PA: Paving Area (ft ²)
45	43560: Conversion Factor square feet to acre (43560 ft2 / acre) ² / acre)
46	
47	
48	7. Construction / Demolition
49	
50	7.1 General Information & Timeline Assumptions
51	
52	- Activity Location
53	County: Johnson
54	Regulatory Area(s): NOT IN A REGULATORY AREA

Start Month:	1
Start Month:	2025
- Activity End Date	e
Indefinite:	False
End Month:	12
End Month:	2025
- Activity Emission	15:
Pollutant	Total Emissions (TONs)
VOC	12.203511
SO _x	0.038775
NO _x	12.076403
CO	14.360093
PM 10	263.000689
7.1 Site Grading	Phase
_	
7.1.1 Site Gradir	ng Phase Timeline Assumptions
- Phase Start Date	
Start Month:	1
	Start Month: - Activity End Date Indefinite: End Month: End Month: - Activity Emission Pollutant VOC SO _x NO _x CO PM 10 7.1 Site Grading 7.1.1 Site Gradin - Phase Start Date

Whiteman WGF

Pollutant	Total Emissions (TONs)
PM 2.5	0.456718
Pb	0.000000
NH ₃	0.017791
CO ₂ e	4155.5

28

29

1 2 3

4

5 6 - Activity Title:

- Activity Description:

- Activity Start Date

See Section 2.1.5

- Phase Duration Number of Month: 12 0

Number of Days:

Start Year:

7.1.2 Site Grading Phase Assumptions 30 21

2025

31			
32	- General Site Grading Information		
33	Area of Site to be Graded (ft ²):		2178000
34	Amount of Material to be Hauled O	n-Site (yd ³):	217
35	Amount of Material to be Hauled O	ff-Site (yd ³):	217
36		-	
37	- Site Grading Default Settings		
38	Default Settings Used:	Yes	
20	A	5(1, 0, 1)	

- Average Day(s) worked per week: 5 (default) 39 40
- 41 - 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

1-0	NOVEMBER 2	023									
	- Vehicle Exh	aust									
	Average l	Hauling Truck	x Capacity (yd	l ³):	20 (defa	ult)					
	Average 1	Average Hauling Truck Round Trip Commute (mile): 20 (default)									
		-	-								
	- Vehicle Exhaust Vehicle Mixture (%)										
		LDGV	LDGT	HDGV	LDDV	LDDT					
	POVs	0	0	0	0	0					
	- Worker Trij Average V - Worker Trij	Worker Roun	-	ute (mile):	20 (default)						
		LDGV	LDGT	HDGV	LDDV	LDDT					
	POVs	50.00	50.00	0	0	0					

12 7.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e		
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89		
Other Construction Equipment Composite										
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e		
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60		
Rubber Tired Dozers Composite										
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e		
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45		
Scrapers Composite	:									
	VOC	SOx	NOx	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/Ba	ackhoes Co	mposite								
	VOC	SOx	NOx	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		

HDDV

100.00

HDDV

0

MC

0

MC

0

15 16

13 14

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

17

18 7.1.4 Site Grading Phase Formula(s)

19 - Fugitive Dust Emissions per Phase

- $PM10_{FD} = (20 * ACRE * WD) / 2000$ 20
- 21 22
- PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 23 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 24 ACRE: Total acres (acres)
- 25 WD: Number of Total Work Days (days)
- 26 2000: Conversion Factor pounds to tons 27

B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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$CE_{PoL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) EFroi: Emission Factor pounds to tons Vehicle Exhaust Emissions per Phase VMTvE = (HADonSite + HAORSite) * (1 / HC) * HT VMTvE : Vehicle Exhaust Vehicle Miles Travel (miles) HAORSite: Amount of Material to be Hauled Off-Site (yd3) HAORSite: Amount of Material to be Hauled Off-Site (yd3) HC: Average Hauling Truck Capacity (yd4) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd3) HC: Average Hauling Truck Round Trip Commute (mile/trip) VFOL = (VMTvE * 0.002205 * EFFOL * VM) / 2000 VFOL: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EFFOL: Emission Factor for Pollutant (grams/mile) VWTvE: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EFFOL: Emission Factor for Pollutant (grams/mile) VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor pounds to tons VMTvET: Worker Trips Emissions per Phase VMTvTT = WD * WT * 1.25 * NE VMTvTT: Worker Trips Vehicle Miles Travel (miles) WD: Number of Construction Equipment WD: Number of Construction Equipment VFOL = (VMTvTT * 0.002205 * EFFOL * VM) / 2000 VFOL = (VMTvTT * 0.002205 * EFFOL * VM) / 2000 VFOL = (VMTvTT * 0.002205 * EFFOL * VM) / 2000 VFOL = (VMTvTT * 0.002205 * EFFOL * VM) / 2000 VFOL = (VMTvTT * 0.002205 * EFFOL * VM) / 2000 VFOL : Vehicle Emissions (TONs) VMTwTT: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor prams to pounds EFFOL: Emission Factor for Pollutant (grams/mile) VMTwTT: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor prams to pounds EFFOL: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Miles Travel (miles) 0.002205: Conversion Factor prams to pounds EFFOL: Emission Factor for Pollutant (grams/mile) VM: W$	1 2	- Construction Exhaust Emissions per Phase CEE _{POL} = (NE * WD * H * EF _{POL}) / 2000
4CEE _{PoL} : Construction Exhaust Emissions (TONs)5NE: Number of Equipment6WD: Number of Total Work Days (days)7H: Hours Worked per Day (hours)8EF _{PoL} : Emission Factor for Pollutant (lb/hour)2000: Conversion Factor pounds to tons11• Vehicle Exhaust Emissions per Phase12VMTv _E = (HA _{OmSite} + HA _{OmSite}) * (1 / HC) * HT13• Vehicle Exhaust Emissions per Phase14VMTv _E = (HA _{OmSite} + HA _{OmSite}) * (1 / HC) * HT15• Vehicle Exhaust Vehicle Miles Travel (miles)16HA _{OmSite} : Amount of Material to be Hauled Off-Site (yd ³)17HC: Conversion Factor cubic yards to trips (1 trip / HC yd ³)18(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)19HT: Average Hauling Truck Round Trip Commute (mile/trip)20VPOL = (VMTv _E * 0.002205 * EFPOL * VM) / 200021VPOL = (VMTv _E * 0.002205 * EFPOL * VM) / 200022Vont: Vehicle Exhaust Or Road Vehicle Miles Travel (miles)230.002205: Conversion Factor grams to pounds24VMTv _E : Vehicle Exhaust On Road Vehicle Mixture (%)2520000: Conversion Factor pounds to tons29• Worker Trips Emissions per Phase11VMTv _T : Worker Trips Vehicle Miles Travel (miles)34WD: Number of Total Work Days (days)35WTr _T : Worker Trips Vehicle Miles Travel (miles)36VPOL = (VMTW _T * 0.002205 * EFPOL * VM) / 200037VPOL = (VMTW _T * 0.002205 * EFPOL * VM) / 200038VMTw _T : Wo		
5NE: Number of Equipment6WD: Number of Total Work Days (days)7H: Hours Worked per Day (hours)8 EF_{POL} : Emission Factor for Pollutant (b/hour)92000: Conversion Factor pounds to tons1• Vehicle Exhaust Emissions per Phase12VMT $v_E = (HA_{OnSile} + HA_{OnSile}) * (1 / HC) * HT13VMTv_E : Vehicle Exhaust Vehicle Miles Travel (miles)14HA_OnSile: Amount of Material to be Hauled On-Site (yd3)15HA_Ansile: Amount of Material to be Hauled Off-Site (yd3)16HAorsile: Amount of Material to be Hauled Off-Site (yd3)17HC: Average Hauling Truck Capacity (yd3)18(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd3)19HT: Average Hauling Truck Round Trip Commute (mile/trip)20VpoL = (VMTvE * 0.002205 * EFPoL * VM) / 200021VpoL = (VMTvE * 0.002205 * EFPoL * VM) / 200022VpoL: Vehicle Exhaust Vehicle Miles Travel (miles)230.002205: Conversion Factor pounds to tons242000: Conversion Factor pounds to tons250.002205: Conversion Factor pounds to tons26EFPoL: Emissions per Phase27VMTwT: Worker Trips Vehicle Miles Travel (miles)34WD: Number of Total Work Days (days)35WT * 20 * WT * 1.25 * NE36VMTwT: Worker Trips Vehicle Miles Travel (miles)37WD: Number of Construction Equipment to Number of Work38VMTwT * 0.002205 * EFPoL * VM) / 200039WT: Average Worker Round Trip Commute (mile$		CEE _{POL} : Construction Exhaust Emissions (TONs)
6WD: Number of Total Work Days (days) H: Hours Worked per Day (hours)7EFroa: Emission Factor Pollutant (lb/hour) 2000: Conversion Factor pounds to tons10• Vehicle Exhaust Emissions per Phase12VMTvE = (HA _{OnSite} + HA _{OTSite}) * (1 / HC) * HT13• Vehicle Exhaust Emission of Material to be Hauled On-Site (yd ³)16HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)17HC: Average Hauling Truck Capacity (yd ³)18(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)19HT: Average Hauling Truck Round Trip Commute (mile/trip)20VPOL = (VMTvE * 0.002205 * EFroL * VM) / 200021VPOL = (VMTvE * 0.002205 * EFroL * VM) / 200022VPOL: Vehicle Enissions (TONs)23VMTve: Vehicle Exhaust Vehicle Miles Travel (miles)240.002205: Conversion Factor grams to pounds250.002205: Conversion Factor pounds to tons29• Worker Trips Emissions per Phase20VMTvr: Wehicle Exhaust On Road Vehicle Milter (%)2000: Conversion Factor Number of Construction Equipment to Number of Work36• WMTwr: Worker Trips Vehicle Miles Travel (miles)37VMTwr: Worker Trips Vehicle Miles Travel (miles)38VPoL: = (VMTvr* 0.002205 * EFroL * VM) / 200039WT: Average Worker Round Trip Commute (mile)301.25: Conversion Factor Number of Construction Equipment to Number of Work38VPoL: = (VMTvr* 0.002205 * EFroL * VM) / 200044VPoL: = (VMTvr* 0.002205 * EFroL * WM / 200045VMTwr: W		
7H: Hours Worked per Day (hours)8 EF_{POL} : Emission Factor for Pollutant (lb/hour)2000: Conversion Factor pounds to tons11-Vehicle Exhaust Emissions per Phase12VMT $v_E = (HA_{OnSite} + HA_{OTSite}) * (1 / HC) * HT13VMTv_E:: Vehicle Exhaust Vehicle Miles Travel (miles)14HA_OnSite: + mount of Material to be Hauled On-Site (yd3)16HA_OnSite: A mount of Material to be Hauled Off-Site (yd3)17HC: Average Hauling Truck Capacity (yd3)18(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd3)19HT: Average Hauling Truck Capacity (yd3)10VPOL = (VMTvE * 0.002205 * EFFOL * VM) / 200023VPOL: Vehicle Emissions (TONs)24VMTvFE: Vehicle Emission Factor grams to pounds250.002205: Conversion Factor grams to pounds26EFFOL: Emission Factor pounds to tons27VM: Vehicle Exhaust On Road Vehicle Miles Travel (miles)28VMTwr = WD * WT * 1.25 * NE29VMTwr: Worker Trips Vehicle Miles Travel (miles)30VMTwr: Worker Trips Vehicle Miles Travel (miles)33WT. Average Worker Round Trip Commute (mile)34VDNTwr: Worker Trips Vehicle Miles Travel (miles)35WT. Average Worker Round Trip Commute (mile)36L2: Conversion Factor number of Construction Equipment to Number of Work36NE: Number of Construction Equipment37VMTwr: Worker Trips Vehicle Miles Travel (miles)38VDOL = (VMTwr * 0.002205 * EFPOL * VM) / 200039$		
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29.30- Worker Trips Emissions per Phase31 $VMT_{WT} = WD * WT * 1.25 * NE$ 33 $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)34WD: Number of Total Work Days (days)35WT: Average Worker Round Trip Commute (mile)361.25: Conversion Factor Number of Construction Equipment to Number of Work37NE: Number of Construction Equipment38V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 200040V_{POL}: Vehicle Emissions (TONs)41V_{POL}: Vehicle Emissions (TONs)42VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)430.002205: Conversion Factor grams to pounds44EF_{PoL}: Emission Factor for Pollutant (grams/mile)45VM: Worker Trips On Road Vehicle Mixture (%)462000: Conversion Factor pounds to tons47487.2 Trenching/Excavating Phase507.2.1 Trenching / Excavating Phase Timeline Assumptions5152- Phase Start Date53Start Month: 1$		
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 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 Work 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 Phase Start Date Start Month: 1 		
 WMT_{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 Work NE: Number of Construction Equipment VPOL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 VPOL: 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 Phase Start Date Start Month: 1 		
 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 Work NE: Number of Construction Equipment VPOL = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000 VPOL: 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 Phase Start Date Start Month: 1 		$VMT_{WT} = WD * WT * 1.25 * NE$
 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 Work 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 Timeline Assumptions - Phase Start Date Start Month: 1 		
 WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor Number of Construction Equipment to Number of Work 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 Timeline Assumptions Phase Start Date Start Month: 1 		
361.25: Conversion Factor Number of Construction Equipment to Number of Work37NE: Number of Construction Equipment383939 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 404141 V_{POL} : Vehicle Emissions (TONs)42VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)430.002205: Conversion Factor grams to pounds44 EF_{POL} : Emission Factor for Pollutant (grams/mile)45VM: Worker Trips On Road Vehicle Mixture (%)462000: Conversion Factor pounds to tons474848 7.2 Trenching/Excavating Phase 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 515253Start Month: 1		
37NE: Number of Construction Equipment38393941 V_{POL} : (VMT _{WT} * 0.002205 * EF _{POL} * VM) / 20004141 V_{POL} : Vehicle Emissions (TONs)42430.002205: Conversion Factor grams to pounds44EF _{POL} : Emission Factor for Pollutant (grams/mile)45VM: Worker Trips On Road Vehicle Mixture (%)462000: Conversion Factor pounds to tons47487.2 Trenching/Excavating Phase505152- Phase Start Date535454555657575858595050515253545455565758585950505152545455565758585950505152545556575858595950505152545556575858595950<		
$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $T.2 Trenching/Excavating Phase$ $V.2 Trenching / Excavating Phase Timeline Assumptions$ $V.2 = Phase Start Date$ $Start Month: 1$		
39 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 4041 V_{POL} : Vehicle Emissions (TONs)42 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)43 0.002205 : Conversion Factor grams to pounds44 EF_{POL} : Emission Factor for Pollutant (grams/mile)45 VM : Worker Trips On Road Vehicle Mixture (%)462000: Conversion Factor pounds to tons474848 7.2 Trenching/Excavating Phase 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 515253Start Month: 1		NE: Number of Construction Equipment
 40 41 V_{POL}: Vehicle Emissions (TONs) 42 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 43 0.002205: Conversion Factor grams to pounds 44 EF_{POL}: Emission Factor for Pollutant (grams/mile) 45 VM: Worker Trips On Road Vehicle Mixture (%) 46 2000: Conversion Factor pounds to tons 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 41 V_{POL}: Vehicle Emissions (TONs) 42 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 43 0.002205: Conversion Factor grams to pounds 44 EF_{POL}: Emission Factor for Pollutant (grams/mile) 45 VM: Worker Trips On Road Vehicle Mixture (%) 46 2000: Conversion Factor pounds to tons 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
 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 		
 43 0.002205: Conversion Factor grams to pounds 44 EF_{POL}: Emission Factor for Pollutant (grams/mile) 45 VM: Worker Trips On Road Vehicle Mixture (%) 46 2000: Conversion Factor pounds to tons 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 44 EF_{POL}: Emission Factor for Pollutant (grams/mile) 45 VM: Worker Trips On Road Vehicle Mixture (%) 46 2000: Conversion Factor pounds to tons 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 45 VM: Worker Trips On Road Vehicle Mixture (%) 46 2000: Conversion Factor pounds to tons 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 2000: Conversion Factor pounds to tons 7.2 Trenching/Excavating Phase 7.2.1 Trenching / Excavating Phase Timeline Assumptions 7.2.1 Trenching / Excavating Phase Timeline Assumptions 5.1 5.2 - Phase Start Date 5.3 Start Month: 1 		
 47 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 48 7.2 Trenching/Excavating Phase 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		2000: Conversion Factor pounds to tons
 49 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		
 50 7.2.1 Trenching / Excavating Phase Timeline Assumptions 51 52 - Phase Start Date 53 Start Month: 1 		7.2 Trenching/Excavating Phase
5152- Phase Start Date53Start Month: 1	49	
52- Phase Start Date53Start Month:1	50	7.2.1 Trenching / Excavating Phase Timeline Assumptions
53 Start Month: 1		
	52	
54 Start Quarter: 1	53	Start Month: 1
	54	Start Quarter: 1

NOVEMBER :									
Start Ye	ar: 2	2025							
Phase Dura	ntion								
	of Montl	h: 12							
	of Days:								
	·								
.2.2 Trend	ching / E	xcavating	Phase As	sumptions					
General Tr	enching/I	Excavating	Informatio	0 n					
			/Excavated		21300				
			auled On-S		2.1				
Amount	of Mater	ial to be H	auled Off-S	Site (yd ³):	2.1				
Trenching	Default S	ettings							
	Settings U		Ŋ	Yes					
		orked per		6 (default)					
				(
Construction	on Exhau								
		Equipn	nent Name				nber Of	Hours	Per Da
Excavators	Composit	<u></u>				Equ	ipment		8
Other Gener			en Composi	ite			1		8
Tractors/Lo							1		8
			pacity (yd ³) and Trip Co	: ommute (m		efault) efault)			
	Hauling	Truck Rou	und Trip Coure (%)	ommute (m	ile): 20 (d	efault)			
Average Vehicle Exl	Hauling haust Veh	Truck Rou	ind Trip Co re (%) LDGT	ommute (m HDGV	ile): 20 (d	efault)			
Average Vehicle Exl POVs	Hauling haust Veh	Truck Rou	und Trip Coure (%)	ommute (m	ile): 20 (d	efault)		DDV 00.00	MC 0
Average Vehicle Ext POVs Worker Tr Average Worker Tr	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG	Truck Rou nicle Mixtu V L Round Tri le Mixture	ind Trip Co ire (%) DGT 0 ip Commut (%) DGT 0	ommute (m HDGV 0 e (mile): HDGV	ile): 20 (d	efault) LDI 0 LDI	1		0 MC
Average Vehicle Ext POVs Worker Tr Average	Hauling haust Veh LDG 0 ips Worker ips Vehic	Truck Rou nicle Mixtu V L Round Tri le Mixture	ind Trip Co re (%) .DGT 0 p Commut	ommute (m HDGV 0 e (mile):	ile): 20 (d LDDV 0 20 (default) LDDV	efault)	1	00.00 DDV	0
Average Vehicle Ext POVs Worker Tr Average Worker Tr	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 <u></u>	ind Trip Co ire (%) <u>DGT</u> 0 ip Commut (%) <u>DGT</u> 50.00	ommute (m <u>HDGV</u> 0 e (mile): <u>HDGV</u> 0	ile): 20 (d LDDV 0 20 (default) LDDV 0	efault) LDI 0 LDI	1	00.00 DDV	0 MC
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend	Hauling haust Veh LDG 0 ips Worker ips Vehic 50.0 ching / E	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating	ind Trip Commut DGT 0 ip Commut (%) DGT ip Commut (%) DGT 50.00 i Phase En	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac	ile): 20 (d LDDV 0 20 (default) LDDV 0 ctor(s)	efault) LDI 0 LDI	1	00.00 DDV	0 MC
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend Construction	Hauling haust Veh DG 0 ips Worker ips Vehic DG 50.0 ching / E	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating	ind Trip Commut DGT 0 ip Commut (%) DGT ip Commut (%) DGT 50.00 i Phase En	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac	ile): 20 (d LDDV 0 20 (default) LDDV 0 ctor(s)	efault) LDI 0 LDI	1	00.00 DDV	0 MC
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend	Hauling haust Veh DG 0 ips Worker ips Vehic DG 50.0 ching / E	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 ± xcavating st Emission	ind Trip Coure (%) DGT 0 p Commut (%) DGT 50.00 p Phase En n Factors (1	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac	ile): 20 (d LDDV 0 20 (default) LDDV 0 ctor(s) fault)	efault)	0T H	00.00 DDV 0	0 MC 0
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend Construction Graders Co	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0 ching / E on Exhau omposite	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00	ind Trip Coure (%) DGT 0 p Commut (%) DGT 50.00 p Phase En n Factors (I SOx	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de	ile): 20 (d LDDV 0 20 (default) LDDV 0 ctor(s) fault) CO	efault)	1 0T H PM 2.5	00.00 DDV 0 CH4	0 MC 0
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend Construction Graders Construction Emission Fa	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0 ching / E on Exhau pon Exhau	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 4 xcavating st Emission VOC 0.0676	ind Trip Co ire (%) <u>DGT</u> 0 ip Commut (%) <u>DGT</u> 50.00 SO _x 0.0014	<pre>ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.3314</pre>	ile): 20 (d LDDV 0 20 (default) LDDV 0 ctor(s) fault)	efault)	0T H	00.00 DDV 0	0 MC 0
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs 7.2.3 Trend Construction Graders Co	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0 ching / E on Exhau pon Exhau	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating st Emission VOC 0.0676 Equipmen	ind Trip Co ire (%) .DGT 0 0 ip Commut (%) .DGT 50.00 3 Phase En n Factors (1 SO _x 0.0014 t Composit	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.3314 e	ile): 20 (d LDDV 0 20 (default) 20 (default) CO 0.5695	efault)	1 0T H PM 2.5 0.0147	00.00 DDV 0 CH4 0.0061	0 MC 0 132.
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs '.2.3 Trend Constructio Graders Co Emission Fa Other Cons	Hauling haust Veh LDG 0 ips Worker ips Vehic 50.0 ching / E on Exhau omposite	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating st Emission VOC 0.0676 Equipmen VOC	ind Trip Course (%) JDGT 0 DGT 0 DGT 5 DGT 5	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.3314 e NOx	ile): 20 (d LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (default) 2	efault)	1 0T H 0T H 0.0147 PM 2.5 0.0147	00.00 DDV 0 CH4 0.0061 CH4	0 MC 0 132
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs '.2.3 Trend Constructio Graders Co Emission Fa Other Cons Emission Fa	Hauling haust Veh LDG 0 ips Worker ips Vehic 50.0 ching / E on Exhau omposite struction actors	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating st Emission voc 0.0676 Equipment VOC 0.0442	ind Trip Commut JDGT 0 ip Commut (%) JDGT ip Commut (%) JDGT 50.00 g Phase En n Factors (I SOx 0.0014 t Composit SOx 0.0012	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.3314 e	ile): 20 (d LDDV 0 20 (default) 20 (default) CO 0.5695	efault)	1 0T H PM 2.5 0.0147	00.00 DDV 0 CH4 0.0061	MC
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs '.2.3 Trend Constructio Graders Co Emission Fa Other Cons	Hauling haust Veh LDG 0 ips Worker ips Vehic 50.0 ching / E on Exhau omposite struction actors	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating st Emission voc 0.0676 Equipment VOC 0.0442	ind Trip Commut JDGT 0 JDGT 0 ip Commut (%) JDGT 50.00 ip Phase En n Factors (I SOx 0.0014 t Composit SOx 0.0012 te	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.3314 e NOx 0.2021	ile): 20 (d LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (default) 2	efault)	1 0T H 0T H 0.0147 PM 2.5 0.0147	00.00 DDV 0 CH4 0.0061 CH4 0.0039	0 MC 0 132. CO 122.
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs '.2.3 Trend Constructio Graders Co Emission Fa Other Cons Emission Fa	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0 ching / E on Exhau omposite actors struction actors ed Dozer	Truck Rou nicle Mixtu V L Round Tri le Mixture V L St Emission VOC 0.0676 Equipment VOC 0.0442 s Composi	ind Trip Commut JDGT 0 ip Commut (%) JDGT ip Commut (%) JDGT 50.00 g Phase En n Factors (I SOx 0.0014 t Composit SOx 0.0012	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.3314 e NOx	ile): 20 (d LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (efault)	PT H PM 2.5 0.0147 PM 2.5 0.0068	00.00 DDV 0 CH4 0.0061 CH4	0 MC 0 132.
Average Vehicle Exl POVs Worker Tr Average Worker Tr POVs .2.3 Trend Construction Graders Construction Graders Construction Emission Fa Other Const Emission Fa Rubber Tir	Hauling haust Veh LDG 0 ips Worker ips Vehic LDG 50.0 ching / E on Exhau ctors struction ctors red Dozer actors	Truck Rou nicle Mixtu V L Round Tri le Mixture V L 00 5 xcavating st Emission st Emission VOC 0.0676 Equipmen VOC 0.0442 s Composi VOC 0.1671	ind Trip Co ire (%) JDGT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.3314 e NOx 0.2021 NOx	ile): 20 (d LDDV 0 20 (default) 20 (default) (default) CO 0.5695 CO 0.3473 CO	efault)	PT H PM 2.5 0.0147 PM 2.5 0.00068 PM 2.5 0.00068	00.00 DDV 0 CH4 0.0061 CH4 0.0039 CH4	0 MC 0 132 CO 122 CO

Emission Factors

VOC

0.1495

SO_x

0.0026

NO_x

0.8387

СО

0.7186

PM 10

0.0334

PM 2.5

0.0334

CH₄

0.0134

CO₂e

262.81

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Tractors/Loaders/Backhoes Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872	

1 2

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

³ 4 5

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

15 - Construction Exhaust Emissions per Phase

- 16 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
 - 2000: Conversion Factor pounds to tons
- 25 Vehicle Exhaust Emissions per Phase
- 26 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
- 27 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 29 HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) 30 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) 31 HC: Average Hauling Truck Capacity (yd³) 32 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) 33 HT: Average Hauling Truck Round Trip Commute (mile/trip) 34 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 35 36 VPOL: Vehicle Emissions (TONs) 37 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 39 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) 40 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%)
- 42 2000: Conversion Factor pounds to tons 43

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B-150	NOVEMBER 2023		
1	- Worker Trips Emissions per Phase		
2 3	$VMT_{WT} = WD * WT * 1.25 * NE$		
4	VMT _{wr} : Worker Trips Vehicle Miles Travel (miles)		
5	WD: Number of Total Work Days (days)		
6	WT: Average Worker Round Trip Commute (mile)	when of Works	
7 8	1.25: Conversion Factor Number of Construction Equipment to Nu NE: Number of Construction Equipment	miller of works	
9			
10	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
11 12	V _{POL} : Vehicle Emissions (TONs)		
12	VPOL. Venicle Emissions (TONS) VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)		
14	0.002205: Conversion Factor grams to pounds		
15	EF _{POL} : Emission Factor for Pollutant (grams/mile)		
16 17	VM: Worker Trips On Road Vehicle Mixture (%)		
17 18	2000: Conversion Factor pounds to tons		
19	7.3 Building Construction Phase		
20	0		
21	7.3.1 Building Construction Phase Timeline Assumptions		
22	- Phase Start Date		
23 24	Start Month: 1		
25	Start Quarter: 1		
26	Start Year: 2025		
27			
28 29	- Phase Duration Number of Month: 12		
29 30	Number of Days: 0		
31			
32	7.3.2 Building Construction Phase Assumptions		
33			
34 35	- General Building Construction Information Building Category: Office or Industrial		
36	Area of Building (ft ²): 871200		
37	Height of Building (ft): 25		
38	Number of Units: N/A		
39 40	Duilding Construction Default Settings		
40 41	- Building Construction Default Settings Default Settings Used: Yes		
42	Average Day(s) worked per week: 5 (default)		
43			
44	- Construction Exhaust (default)		U D D
	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 Welders Composite	3	7 8
45	welkers composite	1	0
46	- Vehicle Exhaust		
47	Average Hauling Truck Round Trip Commute (mile): 20 (der	fault)	

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	LDO	GV I	DGT	HDGV	LDDV	LDI	DT I	HDDV	MC	
POVs	0		0	0	0	0		100.00	0	
			÷	Ť	Ű					
Worker '	Frips									
		Round Tri	p Commut	e (mile):	20 (default)				
	0				,					
Worker '	Frips Vehi c	ele Mixture	(%)							
	LDO	GV I	DGT	HDGV	LDDV	LDI	DT I	HDDV	MC	
POVs	50.0	20 20	50.00	0	0	0		0	0	
 Vendor Trips Average Vendor Round Trip Commute (mile): 40 (default) Vendor Trips Vehicle Mixture (%) 										
vendor	LDC		(%)	HDGV	LDDV	LDI		HDDV	MC	
POVs	0		0	0	0	0		100.00	0	
1018	0		U	U	U	0		100.00	U	
	composite	I		b/hour) (de	1	DM 10	DM 2.5	СЦ	CO	
Emissian	Eastana	VOC	SO _x		CO	PM 10	PM 2.5	CH4	CO2e	
Emission		0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77	
FUIKIIIIS	Composite	1	50	NO	CO	PM 10	PM 2.5	СН	COa	
		VOC	SO x	NO _x	CO	PM 10	PM 2.5	CH ₄		
Emission	Factors	VOC 0.0236	SO _x 0.0006	NO _x 0.0859	CO 0.2147	PM 10 0.0025	PM 2.5 0.0025	CH4 0.0021		
Emission		VOC 0.0236 posite	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449	
Emission Generato	Factors or Sets Com	VOC 0.0236 posite VOC	0.0006 SO _x	0.0859 NO _x	0.2147 CO	0.0025 PM 10	0.0025 PM 2.5	0.0021 CH4	54.449 CO2e	
Emission Generato Emission	Factors or Sets Com Factors	VOC 0.0236 posite VOC 0.0287	0.0006 SO _x 0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449 CO2e	
Emission Generato Emission	Factors or Sets Com	VOC 0.0236 posite VOC 0.0287	0.0006 SO _x 0.0006	0.0859 NO _x	0.2147 CO	0.0025 PM 10	0.0025 PM 2.5	0.0021 CH4	CO2e 61.057	
Emission Generato Emission	Factors or Sets Com Factors /Loaders/B	VOC 0.0236 posite VOC 0.0287 ackhoes Co	0.0006 SO _x 0.0006 omposite	0.0859 NO x 0.2329	0.2147 CO 0.2666	0.0025 PM 10 0.0080	0.0025 PM 2.5 0.0080	0.0021 CH4 0.0025	CO2e 54.449 61.057 CO2e 66.872	
Emission Generato Emission Tractors	Factors or Sets Com Factors /Loaders/B	VOC 0.0236 posite VOC 0.0287 ackhoes Cc VOC	0.0006 SO _x 0.0006 mposite SO _x	0.0859 NOx 0.2329 NOx	0.2147 CO 0.2666 CO	0.0025 PM 10 0.0080 PM 10	0.0025 PM 2.5 0.0080 PM 2.5	0.0021 CH4 0.0025 CH4	54.449 CO2e 61.057 CO2e	
Emission Generato Emission Tractors, Emission	Factors or Sets Com Factors 'Loaders/B Factors	VOC 0.0236 posite VOC 0.0287 ackhoes Cc VOC	0.0006 SO _x 0.0006 mposite SO _x	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x	0.2147 CO 0.2666 CO	0.0025 PM 10 0.0080 PM 10	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5	0.0021 CH4 0.0025 CH4	54.449 CO2e 61.057 CO2e 66.872	
Emission Generato Emission Tractors, Emission	Factors or Sets Com Factors Loaders/B Factors Composite	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335	0.0006 SO _x 0.0006 mposite SO _x 0.0007	0.0859 NO x 0.2329 NO x 0.1857	0.2147 CO 0.2666 CO 0.3586	0.0025 PM 10 0.0080 PM 10 0.0058	0.0025 PM 2.5 0.0080 PM 2.5 0.0058	0.0021 CH4 0.0025 CH4 0.0030	CO2e 61.057 CO2e 66.872 CO2e	
Emission Generato Emission Tractors Emission Welders Emission	Factors or Sets Com Factors (Loaders/B) Factors Composite Factors	VOC 0.0236 aposite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214	0.0006 SO x 0.0006 mposite SO x 0.0007 SO x 0.0003	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x	0.2147 CO 0.2666 CO 0.3586 CO 0.1745	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5	0.0021 CH4 0.0025 CH4 0.0030 CH4	CO2e 61.057 CO2e 66.872 CO2e	
Emission Generato Emission Tractors Emission Welders Emission	Factors or Sets Com Factors (Loaders/B) Factors Composite Factors	VOC 0.0236 aposite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214	0.0006 SO x 0.0006 mposite SO x 0.0007 SO x 0.0003	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x 0.1373	0.2147 CO 0.2666 CO 0.3586 CO 0.1745	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5	0.0021 CH4 0.0025 CH4 0.0030 CH4	CO2e 61.057 CO2e 66.872 CO2e	
Emission Generato Emission Tractors Emission Welders Emission	Factors or Sets Com Factors (Loaders/B) Factors Composite Factors Exhaust & V	VOC 0.0236 aposite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Trip	0.0006 SO x 0.0006 mposite SO x 0.0007 SO x 0.0003 ips Emissio	0.0859 NOx 0.2329 NOx 0.1857 NOx 0.1373 n Factors (g CO 003.169	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019	CO2e 61.057 CO2e 66.872 CO2e 25.650 CO2e	
Emission Generato Emission Tractors/ Emission Welders Emission Vehicle H	Factors Factors Loaders/B Factors Composite Factors Exhaust & V	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Tri SO _x	0.0006 SO _x 0.0006 mposite SO _x 0.0007 SO _x 0.0003 ips Emissio NO _x	0.0859 NOx 0.2329 NOx 0.1857 NOx 0.1373 n Factors (s CO 003.169 003.599	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile PM 10	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051 PM 2.5	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019 NH ₃	54.449 CO2e 61.057 CO2e 66.872 CO2e 25.650 CO2e 00294.55	
Emission Generato Emission Tractors Emission Welders Emission Vehicle H LDGV LDGT HDGV	Factors Factors Loaders/B Factors Composite Factors Exhaust & V VOC 000.207	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Tri SO _x 000.002	0.0006 SO _x 0.0006 mposite SO _x 0.0007 SO _x 0.0003 ips Emissio NO _x 000.106	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x 0.1373 n Factors (s CO 003.169 003.599 013.318	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile PM 10 000.005	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051 PM 2.5 000.004	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019 NH ₃ 000.024	54.449 CO2e 61.057 CO2e 66.872 CO2e 25.650 CO2e 00294.55 00385.07	
Emission Generato Emission Tractors Emission Welders Emission Vehicle H LDGV LDGV LDGT HDGV	Factors r Sets Com Factors Loaders/B Factors Composite Factors Exhaust & VOC 000.207 000.211	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Tri SOx 000.002 000.003	0.0006 SO _x 0.0006 mposite SO _x 0.0007 SO _x 0.0003 ps Emissio NO _x 000.106 000.188	0.0859 NOx 0.2329 NOx 0.1857 NOx 0.1373 n Factors (s CO 003.169 003.599	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile PM 10 000.005 000.006	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051 PM 2.5 000.004 000.006	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019 NH3 000.024 000.026	54.449 CO2e 61.057 CO2e 66.872 CO2e 25.650 CO2e 00294.55 00385.07 00883.11	
Emission Generato Emission Tractors, Emission Welders Emission Emission Uther LDGV LDGV LDGV LDDV LDDV LDDT	Factors r Sets Com Factors Factors Composite Factors Exhaust & V VOC 000.207 000.211 000.798 000.075 000.077	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Tri SOx 000.002 000.003 000.006 000.001	0.0006 SO x 0.0006 mposite SO x 0.0007 SO x 0.0003 Ips Emissio NO x 000.106 000.188 000.815 000.081 000.120	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x 0.1373 n Factors (s CO 003.169 003.599 013.318	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile PM 10 000.005 000.006 000.024 000.003	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051 PM 2.5 000.004 000.004 000.004 000.002 000.002	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019 VH3 000.024 000.024 000.025 000.051 000.008 000.009	54.449 CO2e 61.057 CO2e 66.872 25.650 CO2e 00294.55 00385.07 00348.44	
Emission Generato Emission Tractors Emission Welders Emission Vehicle H LDGV LDGV LDGT HDGV	Factors r Sets Com Factors Composite Factors Factors Cxhaust & V VOC 000.207 000.211 000.798 000.075	VOC 0.0236 posite VOC 0.0287 ackhoes Co VOC 0.0335 VOC 0.0214 Worker Tri SOx 000.002 000.003 000.003 000.004	0.0006 SO x 0.0006 mposite SO x 0.0007 SO x 0.0003 ips Emissio NO x 000.106 000.188 000.815 000.081	0.0859 NO _x 0.2329 NO _x 0.1857 NO _x 0.1373 n Factors (CO 003.169 003.599 013.318 003.102	0.2147 CO 0.2666 CO 0.3586 CO 0.1745 grams/mile PM 10 000.005 000.006 000.024 000.003	0.0025 PM 10 0.0080 PM 10 0.0058 PM 10 0.0051 PM 2.5 000.004 000.004 000.002	0.0025 PM 2.5 0.0080 PM 2.5 0.0058 PM 2.5 0.0051	0.0021 CH4 0.0025 CH4 0.0030 CH4 0.0019 VH3 000.024 000.026 000.051 000.008	54.449 CO2e 61.057 CO2e 66.872 25.650 CO2e 00294.55 00385.07 00883.11 00297.56	

18

19 7.3.4 Building Construction Phase Formula(s) 20

21- Construction Exhaust Emissions per Phase

22	$CEE_{POL} =$	(NE *	WD	* H	* El	FPOL)	/ 2000
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- 23 24 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 25 NE: Number of Equipment

1WD: Number of Total Work Days (days)2H: Hours Worked per Day (hours)3EFequ: Emission Factor pollutant (lb/hour)42000: Conversion Factor pounds to tons5- Vehicle Exhaust Emissions per Phase7VMTvr = BA * BH * (0.42 / 1000) * HT9VMTvr: Vehicle Exhaust Vehicle Miles Travel (miles)10BA: Area of Building (ft ²)11BH: Height of Building (ft)12(0.42 / 1000): Conversion Factor ft ³ to trips (0.42 trip / 1000 ft ³)13HT: Average Hauling Truck Round Trip Commute (mile/trip)14Vrot. = (VMTvre * 0.002205 * EFro.t * VM) / 200016Vrot: Vehicle Ennissions (TONs)17Vrot. = vehicle Exhaust Vehicle Miles Travel (miles)100.002205: Conversion Factor grams to pounds20EFroat: Emissions Factor Pollutant (grams/mile)20VMT ve: Vehicle Exhaust Vehicle Miles Travel (miles)2000: Conversion Factor pounds to tons21VMT wrr Worker Trips On Road Vehicle Miles Travel (miles)222000: Conversion Factor pounds to tons23VMTwr: Worker Trips Vehicle Miles Travel (miles)24VMTwrr = WD * WT * 1.25 * NE25VMTwrr * 0.002205 * EFro.t * VM) / 200026VFro.t. = (vLMTwr * 0.002205 * EFro.t * VM) / 200027Vrot. = Vehicle Emissions (TONs)28VD: Number of Construction Equipment29Vrot. = Norker Trips Denistions (TONs)30VMTwr: Ba * BH * (0.38 / 1000) * HT31VMTwr: Worker Trips On Road Vehicle Miles Travel (miles) </th <th>B-152</th> <th>NOVEMBER 2023</th>	B-152	NOVEMBER 2023
2H: Hours Worked per Day (hours) EFPGL: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons3	1	
3EFreat: Emission Factor for Pollutant (lb/hour)42000: Conversion Factor pounds to tons5• Vehicle Exhaust Emissions per Phase7VMTvE = BA * BH * (0.42 / 1000) * HT9VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)10BA: Area of Building (ft)11BH: Height of Building (ft)12(0.42 / 1000): Conversion Factor ft ³ to trips (0.42 trip / 1000 ft ³)13HT: Average Hauling Truck Round Trip Commute (mile/trip)14Vrot. = (VMTvE * 0.002205 * EFront * VM) / 200015Vrot. = (vehicle Emissions (TONs)16VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)170.002205: Conversion Factor grams to pounds18VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)190.002205: Conversion Factor pounds to tons2000: Conversion Factor pounds to tons21VM: Worker Trips On Road Vehicle Miles Travel (miles)222000: Conversion Factor pounds to tons23VMTwT = WD * WT * 1.25 * NE24VMTwT worker Trips Vehicle Miles Travel (miles)25Conversion Factor Number of Construction Equipment to Number of Works38NE: Number of Total Work Days (days)39WT: Average Worker Trips Vehicle Miles Travel (miles)30Vrot. = (VMTwT * 0.002205 * EFront * VM) / 200031Vrot. = Conversion Factor grams to pounds35Vrot. = Number of Construction Equipment36Vrot. = Vehicle Emissions (TONs)37VMTvTr = BA * BH * (0.38 / 1000) * HT38VMTvTr *		
42000: Conversion Factor pounds to tons5- Vehicle Exhaust Emissions per Phase7 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT8VMT_VE: Vehicle Exhaust Vehicle Miles Travel (miles)9BA: Area of Building (ft)10BA: Area of Building (ft)11(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)12HT: Average Hauling Truck Round Trip Commute (mile/trip)1415VFoL = (VMTVE * 0.002205 * EFroL * VM) / 200016Vroz: Vehicle Emissions (TONs)17Vroz: Vehicle Exhaust Vehicle Miles Travel (miles)18VMTVre: Vehicle Exhaust Vehicle Miles Travel (miles)190.002205: Conversion Factor grams to pounds20EFroz: Emission per Phase2000: Conversion Factor pounds to tons2324• Worker Trips Emissions per Phase25VMTwr: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)28L2: Conversion Factor Number of Construction Equipment to Number of Works29VFoL = (VMTwr * 0.002205 * EFroL * VM) / 200020Vroz: Vehicle Emissions (TONs)20VMTwr: Worker Trips Vehicle Miles Travel (miles)210.002205: Conversion Factor grams to pounds22VMTwr: Worker Trips Vehicle Miles Travel (miles)23VFoL = (VMTwr * 0.002205 * EFroL * VM) / 200024VMTvr: Vender Trips Vehicle Miles Travel (miles)250.002205: Conversion Factor grams to pounds$		
5• Vehicle Exhaust Emissions per Phase $VMTv_E = BA * BH * (0.42 / 1000) * HT9VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)10BA: Area of Building (ft)11BH: Height of Building (ft)12(0.42 / 1000): Conversion Factor ft2 to trips (0.42 trip / 1000 ft3)13HT: Average Hauling Truck Round Trip Commute (mile/trip)1415Vrot. = (VMTvE * 0.002205 * EFrot. * VM) / 20001617Vrot. Vehicle Exhaust Vehicle Miles Travel (miles)180.002205: Conversion Factor ft2 nopulation (grams/mile)190.002205: Conversion Factor pounds to tons202000: Conversion Factor pounds to tons202000: Conversion Factor pounds to tons21VMTwT: Worker Trips Vehicle Miles Travel (miles)22VMTwT: Worker Trips Vehicle Miles Travel (miles)23WD: Number of Total Work Days (days)24WT: Average Worker Round Trip Commute (mile)25VMTwT: Worker Trips Vehicle Miles Travel (miles)26VMTwT: Worker Trips Vehicle Miles Travel (miles)27Vrot. = (VMTwT * 0.002205 * EFrot. * VM) / 200028Vrot.: Vehicle Emissions (TONs)29VMTvT: Worker Trips On Road Vehicle Miles Travel (miles)200.002205: Conversion Factor grams to pounds28EFrot.: Emission Factor for Pollutant (grams/mile)29VMTvT: Worker Trips Vehicle Miles Travel (miles)30Vorter Trips Emissions per Phase31VMTvT: Vender Trips Vehicle Miles Travel (miles)$		
6 • Vehicle Exhaust Emissions per Phase 7 VMTv _E = BA * BH * (0.42 / 1000) * HT 8 VMTv _E : Vehicle Exhaust Vehicle Miles Travel (miles) 9 BA: Area of Building (ft) 10 BA: Area of Building (ft) 11 BH: Height of Building (ft) 12 (0.42 / 1000): Conversion Factor ft ³ to trips (0.42 trip / 1000 ft ³) 13 HT: Average Hauling Truck Round Trip Commute (mile/trip) 14 Vrot. = (VMTv _E * 0.002205 * EFpot. * VM) / 2000 16 Vrot.: Vehicle Emissions (TONs) 17 Vrot.: Vehicle Exhaust Vehicle Miles Travel (miles) 18 VMTv _E : Wehicle Exhaust Vehicle Miles Travel (miles) 19 0.002205: Conversion Factor pounds to tons 20 2000: Conversion Factor pounds to tons 23 • Worker Trips Emissions per Phase VMTw _T : Worker Trips Vehicle Miles Travel (miles) WD: Number of Total Work Days (days) WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor spans to pounds 24 VPOL, = (VMTw _T * 0.002205 * EFpot, * VM) / 2000 1.25: Conversion Factor grams to pounds 25 Vpot, = (VMTw _T * 0.002205 * EFpot, * VM) / 2000 1.25: Conversion Factor grams to pounds 27		2000. Conversion ractor pounds to tons
7VMTv _E = BA * BH * $(0.42 / 1000)$ * HT8VMTv _E : Vehicle Exhaust Vehicle Miles Travel (miles)9BA: Area of Building (ft)11BH: Height of Building (ft)12 $(0.42 / 1000)$: Conversion Factor ft³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$ 13HT: Average Hauling Truck Round Trip Commute (mile/trip)14Vrot. = (VMTv _E * 0.002205 * EFrot. * VM) / 200015Vrot. = (VMTv _E * 0.002205 * EFrot. * VM) / 200016Vrot. = (VMTv _E * 0.002205 * EFrot. * VM) / 200017Vpot.: Vehicle Emission factor for Pollutant (grams/mile)18VMTv _E : Vehicle Exhaust Vehicle Miles Travel (miles)190.002205: Conversion Factor pounds to tons202000: Conversion Factor pounds to tons24• Worker Trips Emissions per Phase25VMTw _T : Worker Trips Vehicle Miles Travel (miles)26WTWTw:: Worker Trips Vehicle Miles Travel (miles)27WMTw _T = WD * WT * 1.25 * NE28WD: Number of Total Work Days (days)29WT: Average Worker Round Trip Commute (mile)30Vrot. = (VMTw _T * 0.002205 * EFrot. * VM) / 200031Vrot. = (VMTw _T * 0.002205 * EFrot. * VM) / 200032Vpot.: Vehicle Emissions (TONs)33Vpot.: Emission Factor grams to pounds34EFrot: Emission Factor for Pollutant (grams/mile)35Vpot.: Vehicle Emissions (TONs)36VMTw _T : Worker Trips Vehicle Miles Travel (miles)370.002205: Conversion Factor grams to pounds38EFrot: Emissions per Phase<		- Vehicle Exhaust Emissions per Phase
8VMTvE: Vehicle Exhaust Vehicle Miles Travel (miles)9bA: Area of Building (ft)11BH: Height of Building (ft)12(0.42/1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)13HT: Average Hauling Truck Round Trip Commute (mile/trip)14VroL = (VMTvE * 0.002205 * EFpoL * VM) / 200015Vhrue * 0.002205 : Conversion Factor grams to pounds16VroL: Vehicle Emissions (TONs)17VmTvE: Vehicle Exhaust Vehicle Miles Travel (miles)190.002205: Conversion Factor grams to pounds20EFrox: Emission Factor pounds to tons21VM: Worker Trips On Road Vehicle Mixure (%)22000: Conversion Factor pounds to tons23VMTwT = WD * WT * 1.25 * NE24VMTwT: Worker Trips Vehicle Miles Travel (miles)25VMTwT: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)28VPoL = (VMTwT * 0.002205 * EFpoL * VM) / 200029Vroct: Vehicle Emissions (TONs)30VPrOL = (VMTwT * 0.002205 * EFpoL * VM) / 200031Vi: Worker Trips Vehicle Miles Travel (miles)320.002205: Conversion Factor grams to pounds33EFpot. Emissions factor for Pollutant (grams/mile)34Vender Trips OR Add Vehicle Miles Travel (miles)350.002205: Conversion Factor for pounds to tons36VMTvT = BA * BH * (0.38 / 1000) * HT37Vender Trips Vehicle Miles Travel (miles)38Dai Area of Building		
10BA: Area of Building (ft ²)11BH: Height of Building (ft)12(0.42 / 1000): Conversion Factor ft ³ to trips (0.42 trip / 1000 ft ³)13HT: Average Hauling Truck Round Trip Commute (mile/trip)14 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 200015V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 200016V_{POL} : Vehicle Emissions (TONs)17V_{POL} : Vehicle Exhaust Vehicle Miles Travel (miles)18VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)100.002205: Conversion Factor for Pollutant (grams/mile)11VK: Worker Trips On Road Vehicle Mikture (%)222000: Conversion Factor pounds to tons23- Worker Trips Emissions per Phase11VMTWT = WD * WT * 1.25 * NE26VMTWT: Worker Trips Vehicle Miles Travel (miles)27VMTWT: Worker Trips Vehicle Miles Travel (miles)28WD: Number of Total Work Days (days)29WT: Average Worker Round Trip Commute (mile)1.25: Conversion Factor Number of Construction Equipment to Number of Works28NE: Number of Construction Equipment29VPoL = (VMTWT * 0.002205 * EFPOL * VM) / 200034VeroL: Vehicle Emissions (TONs)45V/MTWT: Worker Trips Vehicle Miles Travel (miles)460.002205: Conversion Factor pounds to tons47VMTWT: Worker Trips Vehicle Miles Travel (miles)48EFPOL: Emissions per Phase49VMTVT: Vender Trips Vehicle Miles Travel (miles)402000: Conv$		
11BH: Height of Building (ft)12 $(0.42 / 1000)$: Conversion Factor ft to trips $(0.42 \text{ trip} / 1000 \text{ ft})$ 13HT: Average Hauling Truck Round Trip Commute (mile/trip)14Vrot. = (VMTvE * 0.002205 * EFrot. * VM) / 200015Vrot. = (VMTvE * 0.002205 * EFrot. * VM) / 200016Vrot. = (VMTvE * 0.002205 * EFrot. * VM) / 200017Vrot. = (VMTvE * 0.002205 * EFrot. * VM) / 200018VMTvF: Vehicle Emissions (TONs)190.002205: Conversion Factor grans to pounds20EFrot: Emission Factor for Pollutant (grams/mile)21VM: Worker Trips On Road Vehicle Mixture (%)222000: Conversion Factor pounds to tons23• Worker Trips Emissions per Phase24• Worker Trips Emissions per Phase25VMTwT: Worker Trips Vehicle Miles Travel (miles)26WD: Number of Total Work Days (days)27WT: Average Worker Round Trip Commute (mile)38NE: Number of Construction Equipment39VPoL = (VMTwT * 0.002205 * EFrot. * VM) / 200034Vrot. Vehicle Emissions (TONs)35VMTwT: Worker Trips Vehicle Miles Travel (miles)360.002205: Conversion Factor grams to pounds370.002205: Conversion Factor pounds to tons38EFroct. Trips Emissions per Phase39VMTwT: Worker Trips On Road Vehicle Mixture (%)3000: Conversion Factor pounds to tons31• Vender Trips Emissions per Phase32VMTwT: Vender Trips Vehicle Miles Travel (miles)34• Vender Trips Emissio	9	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
12 $(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$ 13HT: Average Hauling Truck Round Trip Commute (mile/trip)1415 V_{POL} : $(VMT_{VE} * 0.002205 * EF_{POL} * VM) / 20001617V_{POL}: Vehicle Emissions (TONs)18VMT_{VF}: Vehicle Exhaust Vehicle Miles Travel (miles)190.002205: Conversion Factor grams to pounds20EF_{POL}: Emission Factor pollutant (grams/mile)21VM: Worker Trips On Road Vehicle Mixture (%)222000: Conversion Factor pounds to tons23- Worker Trips Emissions per Phase24- Worker Trips Emissions per Phase25VMTWT = WD * WT * 1.25 * NE26VMTWT: Worker Trips Vehicle Miles Travel (miles)28WD: Number of Total Work Days (days)29WT: Average Worker Round Trip Commute (mile)301.25: Conversion Factor Number of Construction Equipment to Number of Works31NE: Number of Construction Equipment32VPOL = (VMTWT * 0.002205 * EFPOL * VM) / 20003444VoroL: Vehicle Emissions (TONs)54VMT vrr: Bo On Road Vehicle Miles Travel (miles)550.002205: Conversion Factor pounds to tons36EFPOL: Emissions per Phase41442• Vender Trips Emissions per Phase43VMT_Vr: BA * BH * (0.38 / 1000) * HT44445VMT_Vr: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft)$	10	BA: Area of Building (ft ²)
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$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)$ $0.002205: Conversion Factor grams to pounds$ $EF_{POL}: Emission Factor for Pollutant (grams/mile)$ $VM: Worker Trips On Road Vehicle Mixture (%)$ $2000: Conversion Factor pounds to tons$ $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$ $VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)$ $BA: Area of Building (ft2)$ $HI: Height of Building (ft2)$ $HI: Height of Building (ft3) (0.38 / 1000): Conversion Factor ft3 to trips (0.38 trip / 1000 ft3)$ $HT: Average Hauling Truck Round Trip Commute (mile/trip)$ $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ $V_{POL}: Vehicle Emissions (TONs)$ $VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)$		• •
33 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 3435 V_{POL} : Vehicle Emissions (TONs)36 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)37 0.002205 : Conversion Factor grams to pounds38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39VM: Worker Trips On Road Vehicle Mixture (%)402000: Conversion Factor pounds to tons4142- Vender Trips Emissions per Phase43VMT_{VT} = BA * BH * (0.38 / 1000) * HT4445VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)505153 V_{POL} : Vehicle Emissions (TONs)54VMT_VT: Vender Trips Vehicle Miles Travel (miles)		NE: Number of Construction Equipment
3435 V_{POL} : Vehicle Emissions (TONs)36 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)370.002205: Conversion Factor grams to pounds38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39 VM : Worker Trips On Road Vehicle Mixture (%)2000: Conversion Factor pounds to tons4142- Vender Trips Emissions per Phase43 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT4445VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft2)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft3 to trips (0.38 trip / 1000 ft3)49HT: Average Hauling Truck Round Trip Commute (mile/trip)505153V_{POL}: Vehicle Emissions (TONs)54VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)$		$V_{POL} = (VMT_{WT} * 0.002205 * EE_{POL} * VM) / 2000$
35 V_{POL} : Vehicle Emissions (TONs)36 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)370.002205: Conversion Factor grams to pounds38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39 VM : Worker Trips On Road Vehicle Mixture (%)402000: Conversion Factor pounds to tons41-42- Vender Trips Emissions per Phase43 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$ 44-45 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)50-51 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 52-53 V_{POL} : Vehicle Emissions (TONs)54 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)		$\mathbf{v}_{\text{POL}} = (\mathbf{v}_{\text{POL}} \mathbf{v}_{\text{POL}} \mathbf{v}_{POL$
36 VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)370.002205: Conversion Factor grams to pounds38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39 VM : Worker Trips On Road Vehicle Mixture (%)402000: Conversion Factor pounds to tons41-42- Vender Trips Emissions per Phase43 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$ 4445 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)505151 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 525354 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)		V _{POI} : Vehicle Emissions (TONs)
37 0.002205 : Conversion Factor grams to pounds38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39VM: Worker Trips On Road Vehicle Mixture (%)40 2000 : Conversion Factor pounds to tons41- Vender Trips Emissions per Phase43VMTvT = BA * BH * (0.38 / 1000) * HT44- Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)505151 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 52 V_{POL} : Vehicle Emissions (TONs)54VMT_VT: Vender Trips Vehicle Miles Travel (miles)		
38 EF_{POL} : Emission Factor for Pollutant (grams/mile)39VM: Worker Trips On Road Vehicle Mixture (%)402000: Conversion Factor pounds to tons4142- Vender Trips Emissions per Phase43VMT _{VT} = BA * BH * (0.38 / 1000) * HT4445VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 5253 V_{POL} : Vehicle Emissions (TONs)54VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)		
402000: Conversion Factor pounds to tons4142- Vender Trips Emissions per Phase43VMTvT = BA * BH * (0.38 / 1000) * HT4445VMTvT: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)50 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 52 V_{POL} : Vehicle Emissions (TONs)54VMT_VT: Vender Trips Vehicle Miles Travel (miles)		
4142- Vender Trips Emissions per Phase4343VMTvT = BA * BH * (0.38 / 1000) * HT4445VMTvT: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051VPOL = (VMTvT * 0.002205 * EFPOL * VM) / 20005253VPOL: Vehicle Emissions (TONs)54VMTvT: Vender Trips Vehicle Miles Travel (miles)	39	VM: Worker Trips On Road Vehicle Mixture (%)
42- Vender Trips Emissions per Phase43 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT4445VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft2)47BH: Height of Building (ft)48(0.38 / 1000): Conversion Factor ft3 to trips (0.38 trip / 1000 ft3)49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 20005253V_{POL}: Vehicle Emissions (TONs)54VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)$		2000: Conversion Factor pounds to tons
43 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$ 4445454647484949494149414243444445464748494940494149414243444445464748494940404041424344444445494040414243444444444544454445454646474849494040405051525354545454555657585959505051525354555657585657 <td< td=""><td></td><td></td></td<>		
4445 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48 $(0.38 / 1000)$: Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 5253 V_{POL} : Vehicle Emissions (TONs)54 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)		
45 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)46BA: Area of Building (ft ²)47BH: Height of Building (ft)48 $(0.38 / 1000)$: Conversion Factor ft ³ to trips (0.38 trip / 1000 ft ³)49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 5253 V_{POL} : Vehicle Emissions (TONs)54 VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)		$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
46BA: Area of Building (ft²)47BH: Height of Building (ft)48 $(0.38 / 1000)$: Conversion Factor ft³ to trips $(0.38 \text{ trip } / 1000 \text{ ft³})$ 49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 5253 V_{POL} : Vehicle Emissions (TONs)54VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)		WMT
47BH: Height of Building (ft)48 $(0.38 / 1000)$: Conversion Factor ft ³ to trips $(0.38 \text{ trip} / 1000 \text{ ft}^3)$ 49HT: Average Hauling Truck Round Trip Commute (mile/trip)505151 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 525353 V_{POL} : Vehicle Emissions (TONs)54VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)		
$\begin{array}{ll} 48 & (0.38 / 1000): \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$		
49HT: Average Hauling Truck Round Trip Commute (mile/trip)5051515253545455565758595454555657585950505152535455565758595050515253545556575859505051525354545556575859595050515253545455565758595950505152535455555556575758595950505051525354555555555555555555 </td <td></td> <td></td>		
$\begin{array}{l} 50\\ 51\\ 52\\ 53\\ 54\\ 54\\ 54\\ 54\\ 54\\ 54\\ 54\\ 54\\ 54\\ 54$		
51 $V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$ 52535454555657585950515253545555565757585959505051525354545555565758595950505051525354545556575758595959505050515253545455565758595950505051525354545555565758595950505050515253545555555555555555 <td< td=""><td></td><td>min morage maning mack round mp commute (mine/unp)</td></td<>		min morage maning mack round mp commute (mine/unp)
 52 53 V_{POL}: Vehicle Emissions (TONs) 54 VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 		$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$
 53 V_{POL}: Vehicle Emissions (TONs) 54 VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 		
54 VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)		V _{POL} : Vehicle Emissions (TONs)
55 0.002205: Conversion Factor grams to pounds		
	55	0.002205: Conversion Factor grams to pounds

1 EF_{POL}: Emission Factor for Pollutant (grams/mile) 2 VM: Worker Trips On Road Vehicle Mixture (%) 3 2000: Conversion Factor pounds to tons 4 5 7.4 Architectural Coatings Phase 6 7 7.4.1 Architectural Coatings Phase Timeline Assumptions 8 9 - Phase Start Date 10 Start Month: 6 11 Start Ouarter: 1 12 Start Year: 2025 13 - Phase Duration 14 15 Number of Month: 6 16 Number of Days: 0 17 18 7.4.2 Architectural Coatings Phase Assumptions 19 20 - General Architectural Coatings Information 21 **Building Category:** Non-Residential 22 Total Square Footage (ft²): 871200 23 Number of Units: N/A 24 25 - Architectural Coatings Default Settings 26 **Default Settings Used:** Yes 27 Average Day(s) worked per week: 5 (default) 28 29 - Worker Trips 30 Average Worker Round Trip Commute (mile): 20 (default) 31 32 - Worker Trips Vehicle Mixture (%) LDGV LDGT HDGV LDDV LDDT 50.00 **POVs** 50.00 0 0 0 33 34 7.4.3 Architectural Coatings Phase Emission Factor(s) 35 36 - Worker Trips Emission Factors (grams/mile) VOC **SO**_x **NO**_x CO **PM 10 PM 2.5** Pb LDGV 000.207 000.002 000.106 003.169 000.005 000.004 000.003 003.599 LDGT 000.211 000.188 000.006 000.006 HDGV 000.798 000.006 000.815 013.318 000.024 000.021

37

39

38 7.4.4 Architectural Coatings Phase Formula(s)

000.001

000.001

000.004

000.003

000.081

000.120

002.283

000.686

003.102

002.148

001.470

012.638

000.003

000.003

000.039

000.023

000.002

000.003

000.036

000.021

40 - Worker Trips Emissions per Phase

000.075

000.077

000.102

002.395

41 $VMT_{WT} = (1 * WT * PA) / \hat{800}$

LDDV

LDDT

HDDV

MC

42

- 43 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
- 44 1: Conversion Factor man days to trips (1 trip / 1 man * day)

HDDV

0

NH₃

000.024

000.026

000.051

000.008

000.009

000.032

000.056

MC

0

CO₂e

00294.554

00385.075

00883.115

00297.564

00348.442

01263.110

00393.000

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1	WT: Average Worker Round Trip Commute (mile)		
2	PA: Paint Area (ft^2)		
3	800: Conversion Factor square feet to man days ($1 \text{ ft}^2 / 1 \text{ man } * \text{ da}$	y)	
4			
5	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
6			
7	V _{POL} : Vehicle Emissions (TONs)		
8	VMT _{wT} : Worker Trips Vehicle Miles Travel (miles)		
9	0.002205: Conversion Factor grams to pounds		
10 11	EF _{POL} : Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%)		
12	2000: Conversion Factor pounds to tons		
13	2000. Conversion ractor pounds to tons		
14	- Off-Gassing Emissions per Phase		
15	$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$		
16			
17	VOC _{AC} : Architectural Coating VOC Emissions (TONs)		
18	BA: Area of Building (ft ²)		
19	2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area	/ total area)	
20	0.0116: Emission Factor (lb/ft^2)		
21	2000: Conversion Factor pounds to tons		
22 23	7.5 Paving Phase		
23 24	7.5 raving rhase		
24	7.5.1 Paving Phase Timeline Assumptions		
26	7.5.1 1 aving 1 hase 1 menne Assumptions		
20	- Phase Start Date		
28	Start Month: 1		
29	Start Quarter: 1		
30	Start Year: 2025		
31			
32	- Phase Duration		
33	Number of Month: 12		
34	Number of Days: 0		
35	7.5.2 Paving Phase Assumptions		
36 37	7.5.2 Paving Phase Assumptions		
38	- General Paving Information		
39	Paving Area (ft ²): 325699		
40			
41	- Paving Default Settings		
42	Default Settings Used: Yes		
43	Average Day(s) worked per week: 5 (default)		
44			
45	- Construction Exhaust (default)	Name bar Of	II D D
	Equipment Name	Number Of Equipment	Hours Per Day
	Pavers Composite	1	8
	Paving Equipment Composite	2	6
	Rollers Composite	2	6
46			
47	- Vehicle Exhaust		
48	Average Hauling Truck Round Trip Commute (mile): 20 (def	ault)	
49			

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2	
3	
4	
5	

1

- 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 (%)

7.5.3 Paving Phase Emission Factor(s)

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

7 8

6

9

10

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

Graders Composite

Graders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozen	s Composi	te						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite	:							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	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	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

11 12

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

v chiele L	Anaust &	voinei ill	Po Linissio	a i actors (g	- ams/ mmc	,			
	VOC	SOx	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

13 14

7.5.4 Paving Phase Formula(s)

- 15
- 16 Construction Exhaust Emissions per Phase
- 17 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 23 2000: Conversion Factor pounds to tons24
- 25 Vehicle Exhaust Emissions per Phase
- 26 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$ 27

56	
00	NOVEMBER 2023
	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
	PA: Paving Area (ft ²)
	0.25: Thickness of Paving Area (ft) (1/27). Comparing Fractional Line for the particular $(1 - 1^3/27, 6^3)$
	(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
	2000. Conversion ractor 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
	1.2. Tumber 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 $(43560 \text{ ft}2 / \text{ acre})^2 / \text{ acre})$
ļ	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

1 - Activity Title: B-21 TGOs

	2
2	
3	- Activity Description:
4	2,850 annual TGOs
5	

- 6 Activity Start Date
- 7 Start Month: 1
- 8 **Start Year:** 2025

-		
10	- Activity End Date	

- 11Indefinite:Yes12End Month:N/A
- 12 End Month: N/A 13 End Year: N/A
- 14 15

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.173988
SO _x	4.944107
NO _x	77.771398
СО	5.906712
PM 10	16.377207

16 17

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)				
VOC	0.000000				
SO _x	0.000000				
NO _x	0.000000				
СО	0.000000				
PM 10	0.000000				

18

22

19 8.2 Aircraft & Engines20

21 8.2.1 Aircraft & Engines Assumptions

23	- Aircraft & Engine
24	Aircraft Designation:
25	Engine Model:

21	in ciare Designation.	D 211
25	Engine Model:	F118-GE-100
26	Primary Function:	Transport - Bomber

B-2A

- 27 Aircraft has After burn: No
- 28 **Number of Engines:** 4
- 2930 Aircraft & Engine Surrogate
- 31Is Aircraft & Engine a Surrogate?No32Original Aircraft Name:
- 33 Original Engine Name:34
- 35 8.2.2 Aircraft & Engines Emission Factor(s)
- 36 37

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.753298
Pb	0.000000
NH ₃	0.000000
CO ₂ e	14943.2
	· · · · · · · · · · · · · · · · · · ·

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

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	After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234
1		0.00	0100	0.000	0.00	0100	0100	0.00	0201
2	8.3 Flight O	perations							
3	_	-							
4	8.3.1 Flight	Operations A	Assumption	ıs					
5									
6	- Flight Opera						1	2	
7 8		of Aircraft: eration Cycle	Type		CP (Clo	se Pattern)	1	2	
9		of Annual Flig		n Cycles for			2	580	
10		of Annual Tri					0		
11									
12	- Default Setti	ngs Used:	No						
13				•					
14 15	- Flight Opera Taxi [Idle		l'ime In Mo	de)	0				
15	_	[Approach] ((mins).		5.45				
17		it [Intermedia			4.4				
18		Military] (min			0.48				
19	Takeoff [/	After Burn] (r	nins):		0				
20				N 1 1 G	1 1 6	1. 1. 0		.	1 1 0
21 22	Per the Air Em burner for take								
22	profile was use		nary power a	and J0% and	LIDUINEL (L.		e 101 1-55 v		LS 5.2 mgm
24	prome was ase	(4)							
25	- Trim Test								
26	Idle (mins	·	0						
27	Approach		0						
28 29	Intermedi Military (iate (mins):	0 0						
29 30	AfterBur		0						
31			0						
32	8.3.2 Flight	Operations I	Formula(s)						
33									
34	- Aircraft Em					· Year			
35 36	$AEM_{POL} = (TI)$	M / 60) * (FC /	/ 1000) * EF	* NE * FOC	2000				
30 37	AFM _{DOI} ·	Aircraft Emiss	sions ner Pol	lutant & Mo	de (TONs)				
38		ne in Mode (mi			ue (101(3)				
39		ersion Factor n		urs					
40		Flow Rate (lb/							
41		nversion Facto	1	1					
42 43		sion Factor (lb, ber of Engines)					
43 44		mber of Flight		veles (for all	aircraft)				
45		nversion Factor			unorun)				
46			1						
47	- Aircraft Em								
48	$AE_{FOC} = AEM$	$IDLE_{IN} + AEM$	$IDLE_OUT + A$	EM _{APPROACH}	+ AEM _{CLIMI}	$BOUT + AEM_T$	AKEOFF		
49 50	۸E_ · ^	iroroft Emissi-	\mathbf{m}_{0} (TON ₂)						
50 51		ircraft Emissio IN: Aircraft En		[d]e-In Mode	(TONs)				
52		OUT: Aircraft E							
53		DACH: Aircraft							

1	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
2	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
3	
4	- Aircraft Emissions per Mode for Trim per Year
5	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
6	
7	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
8	TD: Test Duration (min)
9	60: Conversion Factor minutes to hours
10	FC: Fuel Flow Rate (lb/hr)
11	1000: Conversion Factor pounds to 1000pounds
12	EF: Emission Factor (lb/1000lb fuel)
13	NE: Number of Engines
14	NA: Number of Aircraft
15	NTT: Number of Trim Test
16	2000: Conversion Factor pounds to TONs
17	
18	- Aircraft Emissions for Trim per Year
19	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
20	
20	AE _{TRIM} : Aircraft Emissions (TONs)
22	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)
23	AEPS _{APPROACH} : Aircraft Emissions for Approach Power Setting (TONs)
23	AEPS _{INTERMEDIATE} : Aircraft Emissions for Intermediate Power Setting (TONs)
25	AEPS _{MILITARY} : Aircraft Emissions for Military Power Setting (TONs)
26	AEPS _{AFTERBURN} : Aircraft Emissions for After Burner Power Setting (TONs)
27	The BAFTERBURN. The fait Enhissions for The Burner Fower Setting (101(5)
28	
	9. Aircraft
29	7. Allclalt
30	
31	9.1 General Information & Timeline Assumptions
32	
33	- Add or Remove Activity from Baseline? Remove
34	
35	- Activity Location
36	County: Johnson
37	Regulatory Area(s): NOT IN A REGULATORY AREA
38	
39	- Activity Title: B-2A TGOs
40	
41	- Activity Description:
42	1,510 annual TGOs
43	
44	- Activity Start Date
45	Start Month: 1
46	Start Year: 2025
47	
48	- Activity End Date
49	Indefinite: Yes
50	End Month: N/A
51	End Year: N/A
52	
53	- Activity Emissions:
55	Pollutant Emissions Per Year (TONs) Pollutant Emissions Per Year (TONs)
	i onutant Emissions i et i car (1013)

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VOC	-0.101830
SO _x	-2.893644
NO _x	-45.517368
СО	-3.457029
PM 10	-9.585110

1 2

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000
PM 10	0.000000

9.2 Aircraft & Engines

7		
8	- Aircraft & Engine	
9	Aircraft Designation:	B-2A
10	Engine Model:	F118-GE-100
11	Primary Function:	Transport - Bomber
12	Aircraft has After burn:	No
13	Number of Engines:	4
14		
15	- Aircraft & Engine Surrogat	е
16	Is Aircraft & Engine a Su	rrogate? No
17	Original Aircraft Name:	
18	Original Engine Name:	

9.2.1 Aircraft & Engines Assumptions

- 18 Original Engine Name: 19
- 20 9.2.2 Aircraft & Engines Emission Factor(s)
- 21 22

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

23 24

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

28	- Flight Operations
29	Number of Aircraft:

20	Number of Aluenofte		10
29	Number of Aircraft:		12
30	Flight Operation Cycle Type:	CP (Close Pattern)	
31	Number of Annual Flight Operation	Cycles for all Aircraft:	1510
32	Number of Annual Trim Test(s) per	Aircraft:	0
33			
34	- Default Settings Used: No		
35	-		
36	- Flight Operations TIMs (Time In Mode		
37	Taxi [Idle] (mins):	0	

PM 2.5	-8.634682
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-8745.8

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

1	Approach [Approach] (mins):	5.45
2	Climb Out [Intermediate] (mins):	4.4
3	Takeoff [Military] (mins):	0.48
4 5	Takeoff [After Burn] (mins):	0
6	Par the Air Emissions Guide for Air Force Mobile Sources	s, the defaults values for military aircraft equipped with after
7		Inner. (Exception made for F-35 where KARNES 3.2 flight
8	profile was used)	inter. (Exception made for 1-55 where KARNES 5.2 flight
9	prome was used)	
10	- Trim Test	
11	Idle (mins): 0	
12	Approach (mins): 0	
13	Intermediate (mins): 0	
14	Military (mins): 0	
15	AfterBurn (mins): 0	
16		
17	9.3.2 Flight Operations Formula(s)	
18		
19	- Aircraft Emissions per Mode for Flight Operation C	ycles per Year
20	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2$	2000
21		
22	AEM _{POL} : Aircraft Emissions per Pollutant & Mode ((TONs)
23	TIM: Time in Mode (min)	
24	60: Conversion Factor minutes to hours	
25	FC: Fuel Flow Rate (lb/hr)	
26	1000: Conversion Factor pounds to 1000pounds	
27	EF: Emission Factor (lb/1000lb fuel)	
28	NE: Number of Engines	
29	FOC: Number of Flight Operation Cycles (for all aircraft)	
30	2000: Conversion Factor pounds to TONs	
31	Alizza & Essistant for Elizit Orace time Costoners X	7
32	- Aircraft Emissions for Flight Operation Cycles per Y	
33 34	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{APPROA$	$A E IVI_{CLIMBOUT} + A E IVI_{TAKEOFF}$
35	AE _{FOC} : Aircraft Emissions (TONs)	
36	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (T	ON_{S}
37	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode	
38	AEMADLE_001. Alternat Emissions for Approach Mo	
39	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Me	
40	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode	
41		
42	- Aircraft Emissions per Mode for Trim per Year	
43	$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NT$	ГТ / 2000
44		
45	AEPS _{POL} : Aircraft Emissions per Pollutant & Power	Setting (TONs)
46	TD: Test Duration (min)	
47	60: Conversion Factor minutes to hours	
48	FC: Fuel Flow Rate (lb/hr)	
49	1000: Conversion Factor pounds to 1000pounds	
50	EF: Emission Factor (lb/1000lb fuel)	
51	NE: Number of Engines	
52	NA: Number of Aircraft	
53	NTT: Number of Trim Test	
54	2000: Conversion Factor pounds to TONs	
55		

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- 1 Aircraft Emissions for Trim per Year
- 2 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
- 3
- 4 AE_{TRIM}: Aircraft Emissions (TONs)
- 5 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs)
- 6 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)
- 7 AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs)
- 8 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)
- 9 AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)
- 10

Whiteman AFB Alternative Air Conformity Applicability Model Report **B.4.6 Record Of Air Analysis (ROAA)** 2

3 1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 4 an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force 5 Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process 6 (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary 7 of the ACAM analysis. 8

9 a. Action Location: 10

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

- 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
- 18 c. Project Number/s (if applicable): 19
- 20 d. Projected Action Start Date: 1 / 2025

22 e. Action Description: 23

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 (Dvess 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.

36 The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate 37 base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace 38 and range utilization, facilities and infrastructure, and the WGF.

40 Additionally, incorporating B-21 flight training into Global Strike Command's ongoing mission is a dynamic 41 issue that is being addressed in this EIS. To help illustrate the gradual change from B-1 and B-2 to B-21 aircraft 42 operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot 43 scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with 44 incoming B-21 operations and personnel. The "end-state" reflects the point in time when all B 21s are in place 45 and all B-1s or B-2s have been removed.

48	f. Point of Contact:	
49	Name:	Brad Boykin
50	Title:	CTR
51	Organization:	Leidos
52	Email:	boykinb@leidos.com
53	Phone Number:	571-521-8765

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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.

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14 "Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts 15 to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). 16 These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source 17 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 18 19 areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant 20 impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions 21 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 NAAOSs. For further detail on insignificance indicators see chapter 4 22 23 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced 24 Assessments. 25

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

29 Analysis Summary:

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3	1

2025				
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR		
	(ton/yr)	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			

2025

32 33

2026 - (Steady State)				
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR		
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	6.328	250		
NOx	138.569	250		
СО	89.973	250		
SOx	10.320	250		
PM 10	16.691	250		
PM 2.5	14.808	250		

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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.

Brad Boykin, CTR

4/2/2023 DATE

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1B.4.7Whiteman AFB Snapshot ScenarioDetail Air Conformity Applicability2Model Report

<u>1. General</u> Information

4 5 - Action Location 6 Base: WHITEMAN AFB 7 State: Missouri 8 County(s): Johnson 9 **Regulatory** Area(s): NOT IN A REGULATORY AREA 10

- 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):
- 16 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.
- 37 38

39 - Action Description:

40 To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the 41 B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, 42 as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support 43 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 44 activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the 45 MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. 46 Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in 47 this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the 48 analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 49 50 3 beddown actions for either location.

NOVEMBER 2023

1 The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate 2 base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace 3 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.

12 13 - Point of Contact

4

11

15	- Found of Contact	
14	Name:	Brad Boykin
15	Title:	CTR
16	Organization:	Leidos
17	Email:	boykinb@leidos.com
18	Phone Number:	571-521-8765
19		

20 - 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

21 22

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

24 Air Force Transitory Sources.

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2. Personnel

29	2.1	General	Information	&	Timeline	Assumptions
_/		0				

- Add or Remove Activity from Baseline? 31 Add 32 33 - Activity Location 34 **County:** Johnson 35 **Regulatory Area(s):** NOT IN A REGULATORY AREA 36 37 - Activity Title: Personnel - Military 38 39 - Activity Description: 40 Military Personnel - 777 increase under Proposed Action 41 42 - Activity Start Date 43 Start Month: 1 44 Start Year: 2025

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1	- Activity End Date	
2	Indefinite:	Yes
3	End Month:	N/A
4	End Year:	N/A

End Year: N/A

5 6

- 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 ₂ e	1564.1	

7

8	2.2 Personnel Assumptions	
9	-	
10	- Number of Personnel	
11	Active Duty Personnel:	777
12	Civilian Personnel:	0
13	Support Contractor Personnel:	0
14	Air National Guard (ANG) Personnel:	0
15	Reserve Personnel:	0
16		
17	- Default Settings Used: Yes	
18		
19	- Average Personnel Round Trip Commute (1	mile): 20 (default)
20		
21	- Personnel Work Schedule	
22	Active Duty Personnel:	5 Days Per Week (default)
23	Civilian Personnel:	5 Days Per Week (default)
24	Support Contractor Personnel:	5 Days Per Week (default)
25	Air National Guard (ANG) Personnel:	4 Days Per Week (default)
26	Reserve Personnel:	4 Days Per Month (default)
27		

2.3 Personnel On Road Vehicle Mixture 28 29

30 - 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

31

32 2.4 Personnel Emission Factor(s)

33 34

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SOx	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

35

36 2.5 Personnel Formula(s)

37

DRAFT | ENVIRONMENTAL IMPACT STATEMENT

B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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1 - Personnel Vehicle Miles Travel for Work Days per Year 2 $VMT_P = NP * WD * AC$ 3 4 VMT_P: Personnel Vehicle Miles Travel (miles/year) 5 NP: Number of Personnel 6 WD: Work Days per Year 7 AC: Average Commute (miles) 8 9 - Total Vehicle Miles Travel per Year 10 $VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$ 11 12 VMT_{Total}: Total Vehicle Miles Travel (miles) VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles) 13 VMT_C: Civilian Personnel Vehicle Miles Travel (miles) 14 VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles) 15 16 VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles) 17 VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles) 18 19 - Vehicle Emissions per Year 20 $V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$ 21 V_{POL}: Vehicle Emissions (TONs) 22 23 VMT_{Total}: Total Vehicle Miles Travel (miles) 24 0.002205: Conversion Factor grams to pounds 25 EF_{POL}: Emission Factor for Pollutant (grams/mile) 26 VM: Personnel On Road Vehicle Mixture (%) 27 2000: Conversion Factor pounds to tons 28 29 30 **3.** Personnel 31 32 3.1 General Information & Timeline Assumptions 33 34 - Add or Remove Activity from Baseline? Remove 35 36 - Activity Location 37 **County:** Johnson 38 **Regulatory** Area(s): NOT IN A REGULATORY AREA 39 40 - Activity Title: Personnel - Civilian and Contractor 41 42 - Activity Description: 43 Civilian - (-79) 44 Contractor - (-234) 45 46 - Activity Start Date 47 **Start Month:** 1 48 Start Year: 2025 49 50 - Activity End Date Indefinite: 51 Yes 52 End Month: N/A 53 **End Year:** N/A 54

NOVEMBER 2023 Activity Emissions

- ACUVILY 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 ₂ e	-630.1

3.2 Personnel Assumptions

3
4
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4			
5	- Number of Personnel		
6	Active Duty Personnel:	0	
7	Civilian Personnel:	79	
8	Support Contractor Personnel:	234	
9	Air National Guard (ANG) Personnel:	0	
10	Reserve Personnel:	0	
11			
12	- Default Settings Used: Yes		
13			
14	- Average Personnel Round Trip Commute (1	nile):	20 (default)
15			
16	- Personnel Work Schedule		
17	Active Duty Personnel:	5 Day	s Per Week (de
18	Civilian Personnel:	5 Day	s Per Week (de

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 (%)

On Road Venick Mixture (70)							
	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

26 27 28

29

19 20 21

22 23

24 25

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	\mathbf{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

30

31 **3.5** Personnel Formula(s)

- 32
- 33 - Personnel Vehicle Miles Travel for Work Days per Year
- 34 $VMT_P = NP * WD * AC$
- 35
- 36 VMT_P: Personnel Vehicle Miles Travel (miles/year)
- 37 NP: Number of Personnel

WD: Work Da	ays per Year	
	Commute (miles)	
e		
- Total Vehicle Mi	iles Travel per Year	
	$_{\rm O} + \rm VMT_{\rm C} + \rm VMT_{\rm SC} + \rm VMT_{\rm ANG} + \rm VMT_{\rm ANG}$	VMT _{AFRC}
Total Til		hine
VMT _{Total} : Tot	al Vehicle Miles Travel (miles)	
	ve Duty Personnel Vehicle Miles	Fravel (miles)
	an Personnel Vehicle Miles Trave	
	ort Contractor Personnel Vehicle	
	National Guard Personnel Vehicl	
	serve Personnel Vehicle Miles Tra	
A A A A		
Vehicle Emission	1s per Year	
	= 0.002205 * EF _{POL} * VM) / 2000	
1012 (1010	101 , 11	
V _{POL} : Vehicle	Emissions (TONs)	
	al Vehicle Miles Travel (miles)	
	nversion Factor grams to pounds	
	ion Factor for Pollutant (grams/mi	le)
	el On Road Vehicle Mixture (%)	
	sion Factor pounds to tons	
	1	
4. Aircraft		
41.0 11.6	·· • • • • •	.
4.1 General Into	ormation & Timeline Assump	Duons
	A stinite from Dessline? Dem	
- Add or Remove	Activity from Baseline? Rem	love
A attrity T agation	-	
- Activity Location		
•	hnson	
Regulatory A	rea(s): NOT IN A REGULAT	JKY AKEA
A	DALTO	
- Activity Title:	B-2A LTOs	
A . 41-14- D	4°	
- Activity Descript		
736 annual LT	Us	
- Activity Start Da		
Start Month:	1	
Start Year:	2025	
- Activity End Dat		
Indefinite:	Yes	
End Month:	N/A	
End Year:	N/A	
- Activity Emission		
Pollutant	Emissions Per Year (TONs)	Polluta
VOC	-3.838655	PM 2.5
VOC SO _x		
	-3.838655	PM 2.5

Pollutant	Emissions Per Year (TONs)
PM 2.5	-9.980349
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-16893.8

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PM 10 -11.249891

1 2

- 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 ₂ e	-14501.2
PM 10	-9.560539		

3 4 5

6

7

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

/		
8	- Aircraft & Engine	
9	Aircraft Designation:	B-2A
10	Engine Model:	F118-GE-100
11	Primary Function:	Transport - Bomber
12	Aircraft has After burn:	No
13	Number of Engines:	4
14		
15	- Aircraft & Engine Surrogat	e
16	Is Aircraft & Engine a Su	irrogate? No
17	Original Aircraft Name:	
18	Original Engine Name:	
19		
20	4.2.2 Aircraft & Engines E	Emission Factor(s)

21 22

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

- An crart & Englic Emissions Factors (10/100010 fuct)										
	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CO ₂ e		
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		

23 24 25

26

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

2728 - Flight Operations

-	8 · · 1 · · · · · ·		
29	Number of Aircraft:		12
30	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
31	Number of Annual Flight Operation Cycles for	or all Aircraft:	736
32	Number of Annual Trim Test(s) per Aircraft	:	12
33			
34	- Default Settings Used: Yes		
35			
36	- Flight Operations TIMs (Time In Mode)		
37	Taxi [Idle] (mins):	47.7 (default)	
38	Approach [Approach] (mins):	5.2 (default)	
39	Climb Out [Intermediate] (mins):	1.6 (default)	
40	Takeoff [Military] (mins):	0.7 (default)	
41	Takeoff [After Burn] (mins):	0 (default)	

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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

4	
5	- Trim Test
6	Idle (mins): 12 (default)
7	Approach (mins): 27 (default)
8	Intermediate (mins): 9 (default)
9	Military (mins): 12 (default)
10	AfterBurn (mins): 0 (default)
11	
12	4.3.2 Flight Operations Formula(s)
13	
14	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
15	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
16	$M_{\rm HMPOL} = (1101700)$ (1 C 7 1000) Er 10C 7 2000
17	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs)
18	TIM: Time in Mode (min)
19	60: Conversion Factor minutes to hours
20	FC: Fuel Flow Rate (lb/hr)
21	1000: Conversion Factor pounds to 1000pounds
22	EF: Emission Factor (lb/1000lb fuel)
23	NE: Number of Engines
24	FOC: Number of Flight Operation Cycles (for all aircraft)
25	2000: Conversion Factor pounds to TONs
26	
27	- Aircraft Emissions for Flight Operation Cycles per Year
28	$AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
29	
30	AE _{FOC} : Aircraft Emissions (TONs)
31	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)
32	AEM _{IDLE OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
33	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
34	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
35	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
36	
37	- Aircraft Emissions per Mode for Trim per Year
38	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
39	
40	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
41	TD: Test Duration (min)
42	60: Conversion Factor minutes to hours
43	FC: Fuel Flow Rate (lb/hr)
44	1000: Conversion Factor pounds to 1000pounds
45	EF: Emission Factor (lb/1000lb fuel)
46	NE: Number of Engines
47	NA: Number of Aircraft
48	NTT: Number of Trim Test
49	2000: Conversion Factor pounds to TONs
50	A '
51 52	- Aircraft Emissions for Trim per Year
52 52	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
53 54	AFmane: Aircraft Emissions (TONs)
54 55	AE _{TRIM} : Aircraft Emissions (TONs) AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)

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- 1 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) 2
- AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs) 3 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

10 - Default Settings Used: Yes

11 12

4

5 6

7 8

9

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
2	4	No	131-3A	

13 14

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

15 16

Auxiliary Power Unit (APU) Emission Factor (lb/br)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	CO ₂ e
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

18 19 20 21 22 23

24 25

28

29

17

4.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

- APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
- APU: Number of Auxiliary Power Units
- OH: Operation Hours for Each LTO (hour)
- 26 LTO: Number of LTOs 27
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons
- 30 4.5 Aircraft Engine Test Cell
- 31 32 4.5.1 Aircraft Engine Test Cell Assumptions
- 33 34 - Engine Test Cell 35 **Total Number of Aircraft Engines Tested Annually:** 48 36

37 - Default Settings Used: No 38

39	 Annual Run-ups / Test Durations 	
40	Annual Run-ups (Per Aircraft Engine):	1
41	Idle Duration (mins):	12
42	Approach Duration (mins):	27
43	Intermediate Duration (mins):	9
44	Military Duration (mins):	12
45	After Burner Duration (mins):	0
46		
		-

47 **4.5.2** Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & En	gines maission ract	01(5)								
4.5.3 Aircraft Eng	gine Test Cell For	mula(s)								
- Aircraft Engine To	est Cell Emissions p	er Pollutan	t & Power Setting (TON	s)						
$TestCellPS_{POL} = (TD)$	/ 60) * (FC / 1000) *	* EF * NE *	ARU / 2000							
		Cell Emissio	ons per Pollutant & Power	• Setting (TONs)						
TD: Test Duration (min)										
	60: Conversion Factor minutes to hours									
FC: Fuel Flow I		000 1								
	on Factor pounds to 1									
	actor (lb/1000lb fuel)									
	ber of Engines (For A									
	un-ups (Per Aircraft									
2000: Conversio	on Factor pounds to T	UNS								
- Aircraft Engine To	est Cell Emissions n	or Voor								
			ou + TestCellDSummer	MEDIATE + TestCellPS _{MILITARY}						
TestCellPS _{AFTERBURN}		Com SAPPROA	CH I CSCCCIII SINTER	MEDIATE I TESTECHI SMILITARY						
Testeenn DAFTERBURN										
TestCell: Aircra	ft Engine Test Cell E	Emissions (T	(ONs)							
			ons for Idle Power Setting	(TONs)						
			missions for Approach Po							
				ate Power Setting (TONs)						
			nissions for Military Powe							
			Emissions for After Burne							
	C C									
4.6 Aerospace Gr	ound Equipment ((AGE)								
-										
4.6.1 Aerospace (Fround Equipmen	t (AGE) A	ssumptions							
- Default Settings U	sed: Yes									
- AGE Usage										
Number of Ann	ual LTO (Landing	and Take-o	ff) cycles for AGE: 7	36						
- Aerospace Ground	Fauinmont (ACF)	(dofoult)								
Total Number of	Operation Hours	Exempt	AGE Type	Designation						
AGE	for Each LTO	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						
-	1.5	No	Hydraulic Test Stand	MJ-2/TTU-229						
1										
1		No								
1 1 1	4	No No	Light Cart Start Cart	NF-2 A/M32A-60A						

4.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s) 40

41 42

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

	Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	CO ₂ e
--	-------------	--------------	-----	-----	-----	----	-------	--------	-------------------

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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

12

13 14

15

17

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

16 5.1 General Information & Timeline Assumptions

```
18
19
      - Add or Remove Activity from Baseline?
                                                Add
20
21
      - Activity Location
22
          County:
                    Johnson
23
          Regulatory Area(s):
                               NOT IN A REGULATORY AREA
24
25
      - Activity Title:
                       B-21 LTOs
26
```

```
27
      - Activity Description:
28
           2,013.16 annual LTOs
```

- 30 - Activity Start Date
- 31 Start Month: 1
- 32 Start Year: 2025
- 33 34 - Activity End Date 35 **Indefinite:**
- Yes 36 **End Month:** N/A
- 37 **End Year:** N/A
- 38

29

39 - Activity Emissions:

Emissions Per Year (TONs)
10.368519
16.900573
228.994073
146.717567
22.796506

Pollutant	Emissions Per Year (TONs)
PM 2.5	20.114763
Pb	0.000000
NH ₃	0.000000
CO ₂ e	37372.1

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

	ens [1 inglite offer actions (includes		
Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	5.158581	PM 2.5	16.253890
SO _x	10.324859	Pb	0.000000
NO _x	100.111293	NH ₃	0.000000
СО	110.466196	CO ₂ e	31507.5
PM 10	18.789130		

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

-	· · · · · · · · · · · · · · · · · · ·	I I I I I I I I I I I I I I I I I I I
6		
7	- Aircraft & Engine	
8	Aircraft Designation:	B-2A
9	Engine Model:	F118-GE-100
10	Primary Function:	Transport - Bomber
11	Aircraft has After burn:	No
12	Number of Engines:	4
13		
14	- Aircraft & Engine Surrogat	e
15	Is Aircraft & Engine a Su	irrogate? No
16	Original Aircraft Name:	
17	Original Engine Name:	
18		
19	5.2.2 Aircraft & Engines E	Emission Factor(s)

19 5.2.2 Aircraft & Engines Emission Factor(s)20

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e			
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			

22

21

2 3

4 5

23 **5.3 Flight Operations**

5.3.1 Flight Operations Assumptions

2627 - Flight Operations

21	- Fight Operations		
28	Number of Aircraft:		12
29	Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
30	Number of Annual Flight Operation Cycl	es for all Aircraft:	2013.16
31	Number of Annual Trim Test(s) per Airc	raft:	12
32			
33	- Default Settings Used: Yes		
34			
35	- Flight Operations TIMs (Time In Mode)		
36	Taxi [Idle] (mins):	47.7 (default)	
37	Approach [Approach] (mins):	5.2 (default)	
38	Climb Out [Intermediate] (mins):	1.6 (default)	
39	Takeoff [Military] (mins):	0.7 (default)	
40	Takeoff [After Burn] (mins):	0 (default)	

B-178	NOVEMBER 2023							
1		or Air Force Mobile Sources, the defaults values for military aircraft equipped with after						
2		tary power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight						
3	profile was used)							
4	1							
5	- Trim Test							
6	Idle (mins):	12 (default)						
7	Approach (mins):	27 (default)						
8	Intermediate (mins):	9 (default)						
9	Military (mins):	12 (default)						
10	AfterBurn (mins):	0 (default)						
11								
12	5.3.2 Flight Operations F	ormula(s)						
13								
14		de for Flight Operation Cycles per Year						
15 16	$AEM_{POL} = (11M/60) * (FC/60)$	1000) * EF * NE * FOC / 2000						
10	AEMner · Aircraft Emiss	ons per Pollutant & Mode (TONs)						
18	TIM: Time in Mode (min	1						
19	60: Conversion Factor m							
20	FC: Fuel Flow Rate (lb/h							
21	1000: Conversion Factor							
22	EF: Emission Factor (lb/							
23	NE: Number of Engines							
24	FOC: Number of Flight	Operation Cycles (for all aircraft)						
25	2000: Conversion Factor	pounds to TONs						
26								
27		ht Operation Cycles per Year						
28	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{II}$	$DLE_OUT + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$						
29 20								
30	AE _{FOC} : Aircraft Emission							
31 32		issions for Idle-In Mode (TONs) missions for Idle-Out Mode (TONs)						
33		Emissions for Approach Mode (TONs)						
33 34		Emissions for Climb-Out Mode (TONs)						
35		nissions for Take-Off Mode (TONs)						
36								
37	- Aircraft Emissions per Mo	de for Trim per Year						
38	$AEPS_{POL} = (TD / 60) * (FC / 1)$	1000) * EF * NE * NA * NTT / 2000						
39								
40		ions per Pollutant & Power Setting (TONs)						
41	TD: Test Duration (min)							
42	60: Conversion Factor m							
43	FC: Fuel Flow Rate (lb/h							
44	1000: Conversion Factor							
45 46	EF: Emission Factor (lb/	10001b fuel)						
46 47	NE: Number of Engines NA: Number of Aircraft							
48	NTT: Number of Trim T	ect						
49	2000: Conversion Factor							
50		Former to YOY10						
51	- Aircraft Emissions for Tri	n per Year						
52		PPROACH + AEPSINTERMEDIATE + AEPSMILITARY + AEPSAFTERBURN						
53								
54	AE _{TRIM} : Aircraft Emissio							
55	AEPS _{IDLE} : Aircraft Emis	sions for Idle Power Setting (TONs)						

1

AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)

- AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs)
- AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)
- AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

6 5.4 Auxiliary Power Unit (APU)

5.4.1 Auxiliary Power Unit (APU) Assumptions

10 - Default Settings Used: Yes

11 12

7 8

9

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
2	4	No	131-3A	

13 14

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

15 16

Auxiliany Dowon Unit (ADI) Emission Factor (1b/br)

- Auxiliary Power Unit (APU) Emission Factor (10/nr)									
Designation	Fuel	VOC	SOx	NOx	CO	PM 10	PM 2.5	CO ₂ e	
	Flow								
131-3A	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8	

18 19 20 21 22 23

24

25

28

29

36

17

- Auxiliary Power Unit (APU) Emissions per Year

5.4.3 Auxiliary Power Unit (APU) Formula(s)

 $APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

- APUPOL: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
- APU: Number of Auxiliary Power Units
- OH: Operation Hours for Each LTO (hour)
- 26LTO: Number of LTOs27EFPOI: Emission Factor
 - EF_{POL}: Emission Factor for Pollutant (lb/hr)
 - 2000: Conversion Factor pounds to tons
- 30 5.5 Aircraft Engine Test Cell
- 3132 5.5.1 Aircraft Engine Test Cell Assumptions
- 33
 34 Engine Test Cell
 35 Total Number of Aircraft Engines Tested Annually: 48

37 - Default Settings Used: No38

- 39 - Annual Run-ups / Test Durations 40 **Annual Run-ups (Per Aircraft Engine):** 1 **Idle Duration** (mins): 41 12 27 42 **Approach Duration (mins): Intermediate Duration (mins):** 9 43 12 44 **Military Duration (mins):** 45 After Burner Duration (mins): 0 46
- 47 **5.5.2** Aircraft Engine Test Cell Emission Factor(s)

0 NOVEMBER 2023				
- See Aircraft & En	gines Emission Fact	or(s)		
5.5.3 Aircraft En	rina Taat Call Fam	mul o(a)		
5.5.5 Alteratt Eng	gine Test Cen Fori	nuia(s)		
- Aircraft Engine T	est Cell Emissions p	er Pollutant	t & Power Setting (TON	[s)
	/ 60) * (FC / 1000) *			
T. C. UDS			D 11 4 4 9 D	
TestCellPS _{POL} : TD: Test Durati		Cell Emissio	ons per Pollutant & Powe	r Setting (TONS)
	Factor minutes to ho	urs		
FC: Fuel Flow I				
	on Factor pounds to 1			
	actor (lb/1000lb fuel)			
	ber of Engines (For A			
	tun-ups (Per Aircraft on Factor pounds to T			
2000. Conversio	in r uetor poundo to r	0110		
	est Cell Emissions p			
		CellPSAPPROA	ACH + TestCellPS _{INTER}	RMEDIATE + TestCellPS _{MILITARY} +
TestCellPS _{AFTERBURN}				
TestCall, Aires	ft En sin a Tast Call E	·:		
	Ift Engine Test Cell E		ons for Idle Power Settin	a (TONs)
			missions for Approach Po	
				iate Power Setting (TONs)
TestCellPS _{MILITA}	ARY: Aircraft Engine	Test Cell En	nissions for Military Pow	er Setting (TONs)
TestCellPS _{AFTER}	BURN: Aircraft Engin	e Test Cell I	Emissions for After Burne	er Power Setting (TONs)
5.6 Aerospace Gr	ound Equipment ((AGE)		
5.6.1 Aerospace (Fround Equipmen	t (AGE) A	ssumptions	
5.0.1 Acrospace	Fround Equipmen		ssumptions	
- Default Settings U	sed: Yes			
- AGE Usage		1		2012 16
Number of Ann	ual LTO (Landing a	and Take-o	II) cycles for AGE:	2013.16
- Aerospace Ground	l Equipment (AGE)	(default)		
Total Number of	Operation Hours	Exempt	AGE Type	Designation
AGE	for Each LTO	Source?		
1	1.5	No	Air Compressor	MC-1A - 18.4hp
1	12	No	Air Conditioner	Ace 401
1	2 3	No No	Bomb Lift Generator Set	MJ-40 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
1 5.6.2 Aerospace (L			A/M32A-60A

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	CO ₂ e
-------------	--------------	-----	-----	-----	----	-------	--------	-------------------

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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

LTO: Number of LTOs

 $AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

5.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

AGE: Total Number of Aerospace Ground Equipment

OH: Operation Hours for Each LTO (hour)

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

2000: Conversion Factor pounds to tons

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)

18				
19	- Activity Location	ı		
20	County: Jo	hnson		
21	Regulatory A	rea(s):	NOT IN A REGULAT	ORY AREA
22				
23	- Activity Title:	Whitem	an Construction	
24				
25	- Activity Descript	ion:		
26	See Table 2.4.5	5		
27				
28	- Activity Start Da	ite		
29	Start Month:	1		
30	Start Month:	2025		
31				
32	- Activity End Dat	e		
33	Indefinite:	False		
34	End Month:	12		
35	End Month:	2025		
36				
37	- Activity Emission			
	Pollutant	Tota	l Emissions (TONs)	
	VOC		10.189079	
	SO _x		0.030512	
	NO _x		9.692841	

Pollutant	Total Emissions (TONs)
VOC	10.189079
SO _x	0.030512
NO _x	9.692841
СО	12.337556
PM 10	102.330718

- 6.1 Demolition Phase

Pollutant	Total Emissions (TONs)
PM 2.5	0.360206
Pb	0.000000
NH ₃	0.016863
CO ₂ e	3298.9

B-182 NOVEMBER 2023 1 6.1.1 Demolition Phase Timeline Assumptions 2 3 - Phase Start Date 4 Start Month: 1 5 Start Quarter: 1 6 Start Year: 2025 7 8 - Phase Duration 9 Number of Month: 12 10 Number of Days: 0 11 12 6.1.2 Demolition Phase Assumptions 13 14 - General Demolition Information 15 Area of Building to be demolished (ft²): 85001 16 Height of Building to be demolished (ft): 25 17 18 - Default Settings Used: Yes 19 20 - Average Day(s) worked per week: 5 (default) 21 22 - Construction Exhaust (default) **Equipment Name** Number Of **Hours Per Day** Equipment Concrete/Industrial Saws Composite 8 1 1 Rubber Tired Dozers Composite 1 Tractors/Loaders/Backhoes Composite 2 8 23 24 - Vehicle Exhaust 25 Average Hauling Truck Capacity (yd³): 20 (default) Average Hauling Truck Round Trip Commute (mile): 26 20 (default) 27 28 - Vehicle Exhaust Vehicle Mixture (%) LDGV LDGT **HDGV** LDDV LDDT HDDV MC POVs 0 0 0 0 0 100.00 0 29 30 - Worker Trips 31 Average Worker Round Trip Commute (mile): 20 (default) 32 33 - Worker Trips Vehicle Mixture (%) **HDGV** LDDV LDDT LDGV LDGT HDDV MC **POVs** 50.00 50.00 0 0 0 0 0 34 35 6.1.3 Demolition Phase Emission Factor(s) 36 37 - Construction Exhaust Emission Factors (lb/hour) (default) **Concrete/Industrial Saws Composite** VOC **SO**_x **NO**_x CO **PM 10** PM 2.5 CH₄ CO₂e **Emission Factors** 0.0336 0.0006 0.2470 0.3705 0.0093 0.0093 0.0030 58.539 **Rubber Tired Dozers Composite PM 10** PM 2.5 VOC **SO**_x NOx СО CH₄ CO₂e 0.1671 0.0150 239.45 **Emission Factors** 0.0024 1.0824 0.6620 0.0418 0.0418

Tractors/Loaders/Backhoes Composite

VOC

SO_x

NO_x

СО

PM 10

PM 2.5

CH₄

CO₂e

	E
NOVEMBER 2023	
	-

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)

6.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (0.00042 * BA * BH) / 2000$

0.00042: Emission Factor (lb/ft³)

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

BA: Area of Building to be demolished (ft^2)

BH: Height of Building to be demolished (ft) 2000: Conversion Factor pounds to tons

			Po Linibolo						
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

- 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 (ft²) BH: Height of Building being demolish (ft) (1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³) 0.25: Volume reduction factor (material reduced by 75% to account for air space) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) 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
DRAFT B-21 MOB 2 OR MOB 3 BEDDO

NOVEMBER 2023		
 Worker Trips Emissions per Phase VMT_{WT} = WD * WT * 1.25 * NE 		
3		
4 VMT _{WT} : Worker Trips Vehicle Miles Travel (miles) 5 WD: Number of Total Work Days (days)		
 5 WD: Number of Total Work Days (days) 6 WT: Average Worker Round Trip Commute (mile) 		
 7 1.25: Conversion Factor Number of Construction Equipment to Nu 	mber of Works	
8 NE: Number of Construction Equipment		
9		
$0 \qquad V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
 V_{POL}: Vehicle Emissions (TONs) 		
3 VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
4 0.002205: Conversion Factor grams to pounds		
5 EF _{POL} : Emission Factor for Pollutant (grams/mile)		
6 VM: Worker Trips On Road Vehicle Mixture (%)		
7 2000: Conversion Factor pounds to tons		
8 0 62 Site Creding Phase		
9 6.2 Site Grading Phase		
6.2.1 Site Grading Phase Timeline Assumptions		
2		
23 - Phase Start Date		
24 Start Month: 1		
25 Start Quarter: 1		
26 Start Year: 2025		
27 28 - Phase Duration		
29 Number of Month: 12		
30 Number of Days: 0		
 6.2.2 Site Grading Phase Assumptions 33 		
- General Site Grading Information		
35 Area of Site to be Graded (ft2): 850451.2		
Amount of Material to be Hauled On-Site (yd ³): 85		
Amount of Material to be Hauled Off-Site (yd ³): 85		
38 39 - Site Grading Default Settings		
Default Settings Used: Yes		
Average Day(s) worked per week: 5 (default)		
42		
43 - Construction Exhaust (default)		
Equipment Name	Number Of Equipment	Hours Per
Excavators Composite	1 I	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
-4 -5 - Vehicle Exhaust		
	ault)	
46Average Hauling Truck Capacity (yd³):20 (det20 (det	fault)	

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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

- Vehicle Exhaust Vehicle Mixture (%)

- Venicie Exhaust Venicie Mixture (70)										
	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 (%)

worker mips vehicle winkture (70)										
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC			
POVs	50.00	50.00	0	0	0	0	0			

9 10

1

2 3

4 5

6

7 8

11 12

6.2.3 Site Grading Phase Emission Factor(s)

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

Excavators Compos	ite										
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70			
Graders Composite											
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89			
Other Construction	Equipment	Composite	9	•							
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60			
Rubber Tired Dozen	s Composit	te									
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e			
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45			
Scrapers Composite				•							
	VOC	SOx	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/Ba	ackhoes Co	mposite									
	VOC	SOx	NOx	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			

13 14

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

15

16 **6.2.4 Site Grading Phase Formula(s)**

1718 - Fugitive Dust Emissions per Phase

- 19 $PM10_{FD} = (20 * ACRE * WD) / 2000$
- 20
- 21 PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 22 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 23 ACRE: Total acres (acres)
- 24 WD: Number of Total Work Days (days)

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1	2000: Conversion Factor pounds to tons
2	
3	- Construction Exhaust Emissions per Phase
4 5	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
6	CEE _{POL} : Construction Exhaust Emissions (TONs)
7	NE: Number of Equipment
8	WD: Number of Total Work Days (days)
9	H: Hours Worked per Day (hours)
10	EF _{POL} : Emission Factor for Pollutant (lb/hour)
11	2000: Conversion Factor pounds to tons
12	Vahiala Ewhowat Emissions nor Dhose
13 14	- Vehicle Exhaust Emissions per Phase VMT _{VE} = (HA _{OnSite} + HA _{OffSite}) * (1 / HC) * HT
15	$V_{\rm H} V_{\rm E} = (\Pi A_{\rm OnSite} + \Pi A_{\rm OffSite}) (1 + \Pi C) \Pi \Pi$
16	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
17	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
18	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
19	HC: Average Hauling Truck Capacity (yd ³)
20	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
21 22	HT: Average Hauling Truck Round Trip Commute (mile/trip)
22	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
24	
25	V _{POL} : Vehicle Emissions (TONs)
26	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
27	0.002205: Conversion Factor grams to pounds
28	EF _{POL} : Emission Factor for Pollutant (grams/mile)
29 30	VM: Vehicle Exhaust On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons
31	2000. Conversion Pactor pounds to tons
32	- Worker Trips Emissions per Phase
33	$VMT_{WT} = WD * WT * 1.25 * NE$
34	
35	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
36	WD: Number of Total Work Days (days)
37 38	WT: Average Worker Round Trip Commute (mile) 1.25: Conversion Factor Number of Construction Equipment to Number of Works
39	NE: Number of Construction Equipment
40	1 1
41	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
42	
43	V _{POL} : Vehicle Emissions (TONs)
44 45	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds
45 46	EF _{POL} : Emission Factor for Pollutant (grams/mile)
47	VM: Worker Trips On Road Vehicle Mixture (%)
48	2000: Conversion Factor pounds to tons
49	
50	6.3 Trenching/Excavating Phase
51	
52	6.3.1 Trenching / Excavating Phase Timeline Assumptions
53	- Phase Start Date
54	Start Month: 1

Start Quarter:	1							
Start Year:	2025							
- Phase Duration								
- Phase Duration Number of Mo	nth: 12							
Number of Day								
rumber of Duy	5. 0							
6.3.2 Trenching /	Excavating	Phase As	sumptions					
,		,	••••••P•••••					
- General Trenchin	g/Excavating	, Informatio	on					
Area of Site to				0				
Amount of Mat				0				
Amount of Mat	erial to be H	auled Off-S	Site (yd ³):	0				
- Trenching Default	Sottings							
Default Setting		Ŋ	les					
Average Day(s)			(default)					
	1		· /					
- Construction Exh								
	Equip	nent Name				nber Of	Hours	s Per Day
					Equ	ipment		
Average Haulin Average Haulin	ng Truck Rou	und Trip C		20 (d ile): 20 (d	lefault)			
Average Haulin - Vehicle Exhaust V	ng Truck Rou <u>Tehicle Mixtu</u>	und Trip Coure (%)	ommute (m	ile): 20 (d	lefault)		HDDV	МС
Average Haulin - Vehicle Exhaust V	ng Truck Rou <u>Tehicle Mixtu</u>	und Trip C					HDDV 100.00	<u>МС</u> 0
Average Haulin - Vehicle Exhaust V DOVs - Worker Trips Average Worker	er Round Tri	ind Trip Control of the text of text o	ommute (m HDGV 0	ile): 20 (c	lefault) LDI 0			
Average Haulin - Vehicle Exhaust V DOVs - Worker Trips Average Worker - Worker Trips Vel	eg Truck Rod Gehicle Mixtu OGV I 0 er Round Tri nicle Mixture	ind Trip Coure (%) DGT 0 ip Commut (%)	ommute (m HDGV 0 e (mile):	ile): 20 (c	lefault)		100.00	0
Average Haulin - Vehicle Exhaust V DOVs - Worker Trips Average Worke - Worker Trips Vel LI	er Round Tri bicle Mixtu 0 er Round Tri bicle Mixture 0 GV I	ind Trip Control of the text of text o	ommute (m HDGV 0	ile): 20 (c	lefault) LDI 0			
Average Haulin - Vehicle Exhaust V POVs - Worker Trips Average Worke - Worker Trips Vel DOVs 5 6.3.3 Trenching / - Construction Exh	er Round Tri bicle Mixture o bicle Mixture bicle Mixture b	und Trip Coure (%) DGT 0 ip Commut (%) DGT ip Commut (%) DGT 50.00 g Phase En	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s)	lefault) LDI 0 LDI		100.00 HDDV	0 MC
Average Haulin - Vehicle Exhaust V POVs - Worker Trips Average Worke - Worker Trips Vel DOVs 5 - 0.3.3 Trenching /	er Round Tri bicle Mixture o bicle Mixture o bicle Mixture bicle Mixture	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (1	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de	ile): 20 (d LDDV 0 20 (default) 20 (default) 0 ctor(s) fault)	lefault)	DT]	100.00 HDDV 0	0 MC 0
Average Haulin - Vehicle Exhaust V II POVs - Worker Trips Average Worker - Worker Trips Vel - UI POVs 5 6.3.3 Trenching / - Construction Exhibits Excavators Comp	er Round Tri icle Mixture Cehicle Mixture Cer Round Tri icle Mixture COV I COV I	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (I SOx	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de	ile): 20 (c LDDV 0 20 (default) 20 (default) CO	lefault)	PM 2.5	HDDV 0 CH4	0 MC 0 CO2e
Average Haulin - Vehicle Exhaust V II POVs - Worker Trips Average Worker - Worker Trips Vel II POVs 5 - 6.3.3 Trenching / - Construction Exhi Excavators Comp Emission Factors	ing Truck Rom indepicte Mixture OGV I 0 er Round Tri inicle Mixture OGV I DGV I	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (1	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de	ile): 20 (d LDDV 0 20 (default) 20 (default) 0 ctor(s) fault)	lefault)	DT]	100.00 HDDV 0	0 MC 0 CO ₂ e
Average Haulin - Vehicle Exhaust V II POVs - Worker Trips Average Worker - Worker Trips Vel - UI POVs 5 6.3.3 Trenching / - Construction Exhibits Excavators Comp	er Round Tri icle Mixture OGV I 0 er Round Tri icle Mixture OGV I 0.00 S Excavating aust Emission osite VOC 0.0559 te	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (1 SO _x 0.0013	<pre>ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NOx 0.2269</pre>	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 Ctor(s) fault) CO 0.5086	lefault)	PM 2.5 0.0086	100.00 HDDV 0 CH4 0.0050	0 MC 0 CO2e 119.70
Average Haulin - Vehicle Exhaust V II POVs - Worker Trips Average Worker - Worker Trips Vel II POVs 5 - 6.3.3 Trenching / - Construction Exhi Excavators Comp Emission Factors	ing Truck Rom indepicte Mixture OGV I 0 er Round Tri inicle Mixture OGV I DGV I	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (I SOx	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de	ile): 20 (c LDDV 0 20 (default) 20 (default) CO	lefault)	PM 2.5	HDDV 0 CH4	0 MC 0 0 119.70 CO2e
Average Haulin - Vehicle Exhaust V Delta II POVs - Worker Trips Average Worker - Worker Trips Vel Delta II POVs - Construction Exhi Excavators Comp Emission Factors Graders Composi	ig Truck Roi iehicle Mixtu OGV I 0 er Round Tri iicle Mixture OGV I 0.00 3 Excavating aust Emission osite VOC 0.0559 ie VOC 0.0676	und Trip Coure (%) DGT 0 ip Commut : <td:< td=""> : : : : : : : : : : : : <td:< td=""> <td:< td=""></td:<></td:<></td:<>	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 20 ctor(s) fault) CO 0.5086 CO	lefault)	PM 2.5 0.0086 PM 2.5	100.00 HDDV 0 0 CH4 0.0050 CH4	0 MC 0 0 119.70
Average Haulin - Vehicle Exhaust V POVs - Worker Trips Average Worke - Worker Trips Vel OVs - Worker Trips Vel OVs - Construction Exhi Excavators Composi Emission Factors Graders Composi Emission Factors Other Constructio	ig Truck Roi (ehicle Mixtu OGV I 0 er Round Tri hicle Mixture OGV I 0.00 S Excavating aust Emission osite VOC 0.0676 n Equipmen VOC	und Trip Coure (%) DGT 0 ip Commut : <td:< td=""> : : : : : : : : : : : : <td:< td=""> <td:< td=""></td:<></td:<></td:<>	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 20 ctor(s) fault) CO 0.5086 CO	lefault)	PM 2.5 0.0086 PM 2.5	100.00 HDDV 0 0 CH4 0.0050 CH4	0 MC 0 0 119.70 CO2e
Average Haulin - Vehicle Exhaust V II POVs - Worker Trips Average Worker - Worker Trips Vel - UI POVs - Worker Trips Vel G.3.3 Trenching / - Construction Exhi Excavators Comp Emission Factors Graders Composi Emission Factors Other Constructio Emission Factors	ag Truck Roi ag Truck Roi GV I O I 0 I er Round Tri aicle Mixture OGV I 0 I aicle Mixture OGV I 0.00 I b.00 I <td< td=""><td>and Trip Co ure (%) JDGT 0 ip Commut :(%) JDGT :DGT :0 ip Commut :(%) JDGT :DGT :50.00 : <</td><td>ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO_x 0.2269 NO_x 0.3314 e</td><td>ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5086 CO 0.5695</td><td>lefault)</td><td>PM 2.5 0.0086 PM 2.5 0.0147</td><td>100.00 HDDV 0 0 CH4 0.0050 CH4 0.0061</td><td>0 MC 0 0 119.70 CO2e 132.89 CO2e</td></td<>	and Trip Co ure (%) JDGT 0 ip Commut :(%) JDGT :DGT :0 ip Commut :(%) JDGT :DGT :50.00 : <	ommute (m HDGV 0 e (mile): HDGV 0 nission Fac b/hour) (de NO _x 0.2269 NO _x 0.3314 e	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5086 CO 0.5695	lefault)	PM 2.5 0.0086 PM 2.5 0.0147	100.00 HDDV 0 0 CH4 0.0050 CH4 0.0061	0 MC 0 0 119.70 CO2e 132.89 CO2e
Average Haulin - Vehicle Exhaust V POVs - Worker Trips Average Worke - Worker Trips Vel OVs - Worker Trips Vel OVs - Construction Exhi Excavators Composi Emission Factors Graders Composi Emission Factors Other Constructio	ag Truck Rot GV I O I 0 I er Round Tri bicle Mixture OGV I OGV I DGV I DOO S Excavating I osite VOC 0.0559 I I 0.0676 I Equipmen VOC 0.0442 ers Composi	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (1 SOx 0.0013 SOx 0.0014 t Composit SOx 0.0012 te	HDGV 0 e (mile): HDGV 0 sission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021	ile): 20 (c LDDV 0 20 (default) 20 (default) 100 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 20 (def	LDI LDI 0 0 LDI 0 0 0 0 0 0 0 0 0 0 0 0 0	PM 2.5 0.0086 PM 2.5 0.0147 PM 2.5 0.0068	100.00 HDDV 0 CH4 0.0050 CH4 0.0061 CH4 0.0039	0 MC 0 0 119.70 CO2e 132.89 CO2e 122.60
Average Haulin - Vehicle Exhaust V ILI POVs - Worker Trips Average Worker - Worker Trips Vel - UI POVs - Worker Trips Vel - LI POVs - Solution - Construction Exhi Excavators Composite Emission Factors Graders Composite Emission Factors Other Construction Emission Factors Rubber Tired Doz	ig Truck Roi iehicle Mixtu OGV I 0 er Round Tri icle Mixture OGV I 0.00 2 Excavating aust Emission osite VOC 0.0559 te VOC 0.0676 in Equipmen VOC 0.0442 ers Composi VOC	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 Phase En n Factors (1 SO _x 0.0013 Composit SO _x 0.0014 t Composit SO _x 0.0012 te SO _x	HDGV 0 e (mile): HDGV 0 ission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021 NOx 0.2021	ile): 20 (c LDDV 0 20 (default) 20 (default) 10 20 (default) 0 20 2	efault)	PM 2.5 0.0086 PM 2.5 0.0147 PM 2.5 0.0068 PM 2.5 0.0068	100.00 HDDV 0 CH4 0.0050 CH4 0.0061 CH4 0.0039 CH4	0 MC 0 0 119.70 CO2e 132.89 CO2e 122.60 CO2e
Average Haulin - Vehicle Exh=ust V POVs POVs - Worker Trips Average Worka - Worker Trips Vel - Worker Trips Vel POVs - Worker Trips 6.3.3 Trenching / - Construction Exh Excavators Comp Emission Factors Graders Composi Emission Factors Other Construction Emission Factors Rubber Tired Doz Emission Factors	ing Truck Roo ing Truck Roo interpretation interpretation inter	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 g Phase En n Factors (1 SOx 0.0013 SOx 0.0014 t Composit SOx 0.0012 te	HDGV 0 e (mile): HDGV 0 sission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021	ile): 20 (c LDDV 0 20 (default) 20 (default) 100 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 0 20 (default) 20 (def	LDI LDI 0 0 LDI 0 0 0 0 0 0 0 0 0 0 0 0 0	PM 2.5 0.0086 PM 2.5 0.0147 PM 2.5 0.0068	100.00 HDDV 0 CH4 0.0050 CH4 0.0061 CH4 0.0039	0 MC 0 0 119.70 CO2e 132.89 CO2e 122.60
Average Haulin - Vehicle Exhaust V ILI POVs - Worker Trips Average Worker - Worker Trips Vel - UI POVs - Worker Trips Vel - LI POVs - Solution - Construction Exhi Excavators Composite Emission Factors Graders Composite Emission Factors Other Construction Emission Factors Rubber Tired Doz	ing Truck Roo ing Truck Roo interpretation interpretation inter	ind Trip Coure (%) DGT 0 ip Commut (%) DGT 50.00 Phase En n Factors (1 SO _x 0.0013 Composit SO _x 0.0014 t Composit SO _x 0.0012 te SO _x	HDGV 0 e (mile): HDGV 0 ission Fac b/hour) (de NOx 0.2269 NOx 0.3314 e NOx 0.2021 NOx 0.2021	ile): 20 (c LDDV 0 20 (default) 20 (default) 10 20 (default) 0 20 2	efault)	PM 2.5 0.0086 PM 2.5 0.0147 PM 2.5 0.0068 PM 2.5 0.0068	100.00 HDDV 0 CH4 0.0050 CH4 0.0061 CH4 0.0039 CH4	0 MC 0 0 119.70 CO2e 132.89 CO2e 122.60 CO2e

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Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

1 2

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

· emere z		VOIRCI III				,			
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

trip / HC yd³)

5 6

9

12

6.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

- 7 $PM10_{FD} = (20 * ACRE * WD) / 2000$ 8
 - PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 10 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 11 ACRE: Total acres (acres)
 - WD: Number of Total Work Days (days)

13	2000: Conversion Factor pounds to tons
14	-
15	- Construction Exhaust Emissions per Phase
16	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
17	
18	CEE _{POL} : Construction Exhaust Emissions (TONs)
19	NE: Number of Equipment
20	WD: Number of Total Work Days (days)
21	H: Hours Worked per Day (hours)
22	EF _{POL} : Emission Factor for Pollutant (lb/hour)
23	2000: Conversion Factor pounds to tons
24	
25	- Vehicle Exhaust Emissions per Phase
26	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
27	
28	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
29	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
30	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
31	HC: Average Hauling Truck Capacity (yd ³)
32	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC y
33	HT: Average Hauling Truck Round Trip Commute (mile/trip)
34	
35	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
36	· · · · · · · · · · · · · · · · · · ·

37 V_{POL}: Vehicle Emissions (TONs)

- 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
- 39 0.002205: Conversion Factor grams to pounds
- 40 EF_{POL}: Emission Factor for Pollutant (grams/mile)
- 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%)
- 42 2000: Conversion Factor pounds to tons

³ 4

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1 2	- Worker Trips Emissions per Phase VMT _{WT} = WD * WT * 1.25 * NE		
3			
4	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)		
5	WD: Number of Total Work Days (days)		
6	WT: Average Worker Round Trip Commute (mile)		
7	1.25: Conversion Factor Number of Construction Equipment to Num	mber of Works	
8 9	NE: Number of Construction Equipment		
10	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
11			
12	V _{POL} : Vehicle Emissions (TONs)		
13	VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)		
14	0.002205: Conversion Factor grams to pounds		
15	EF_{POL} : Emission Factor for Pollutant (grams/mile)		
16	VM: Worker Trips On Road Vehicle Mixture (%)		
17	2000: Conversion Factor pounds to tons		
18 19	6.4 Building Construction Phase		
19 20	0.4 Dunuing Construction Phase		
20	6.4.1 Building Construction Phase Timeline Assumptions		
21	0.4.1 Dunding Construction I hase Timenne Assumptions		
22	- Phase Start Date		
23 24	Start Month: 1		
25	Start Quarter: 1		
26	Start Year: 2025		
27			
28	- Phase Duration		
29	Number of Month: 12		
30	Number of Days: 0		
31	·		
32	6.4.2 Building Construction Phase Assumptions		
33			
34	- General Building Construction Information		
35	Building Category: Office or Industrial		
36	Area of Building (ft^2): 735632		
37	Height of Building (ft): 25		
38 39	Number of Units: N/A		
39 40	- Building Construction Default Settings		
40	Default Settings Used: Yes		
42	Average Day(s) worked per week: 5 (default)		
43			
44	- Construction Exhaust (default)		
	Equipment Name	Number Of	Hours Per Day
	Cranes Composite	Equipment 1	7
	Forklifts Composite	3	8
	Generator Sets Composite	1	8
	Tractors/Loaders/Backhoes Composite	3	7
	Welders Composite	1	8
45	- Vehicle Exhaust	*	
46	Average Hauling Truck Round Trip Commute (mile): 20 (def.	ault)	
47			

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- venicie i	Exhaust Vel								
	LDO		DGT	HDGV	LDDV			HDDV	MC
POVs	0		0	0	0	0		100.00	0
- Worker	Tring								
	ige Worker	Round Tri	n Commut	e (mile)•	20 (default)			
Avera	ige worker	Kouliu III	p Commut	e (iiiie).	20 (default)			
- Worker	Trips Vehic	ele Mixture	(%)						
	LDO	GV L	DGT	HDGV	LDDV	LDI)T I	HDDV	MC
POVs	50.0	00	50.00	0	0	0		0	0
Vondon'	Fuina								
- Vendor	i rips ige Vendor	Round Tri	n Commute	(mile)•	40 (default)			
Avera	ige venuor	Kounu III	p Commun	e (mne).	40 (ucraun)			
- Vendor '	Frips Vehic	le Mixture	(%)						
			DGT	HDGV	LDDV	LDI)T I	HDDV	MC
POVs	0		0	0	0	0		100.00	0
		sti uction i			JUI (5)				
6.4.3 Bu	ilding Con	struction	Phase Emi	ssion Fact	cor(s)				
- Constru	ction Exhau	ist Emission	n Factors (l	b/hour) (de	efault)				
Cranes (Composite			1			1		
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO
Emission		0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.
Forklifts	Composite		I	T	I	I	r		-1
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO
Emission		0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.4
Generat	or Sets Com		1	1		1	I	_	
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO
Emission		0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.0
Tractors	/Loaders/B	1		1		1	1		
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO
Emission		0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.8
Welders	Composite		-		-	-	1	-	_
		VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO
Emission	Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.6
- Vehicle l	Exhaust & V	Worker Tri	ips Emissio	n Factors (grams/mile)			
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{NH}_3	CO ₂
LDGV	000.207	000.002	000.106	003.169	000.005	000.004		000.024	00294.
LDGT	000.211	000.003	000.188	003.599	000.006	000.006		000.026	00385.
HDGV	000.798	000.006	000.815	013.318	000.024	000.021		000.051	00883.
LDDV	000.075	000.001	000.081	003.102	000.003	000.002		000.008	00297.
· · · ·	000.077	000.001	000 100						

18

LDDT

HDDV

MC

19 6.4.4 Building Construction Phase Formula(s)

000.001

000.004

000.003

000.120

002.283

000.686

002.148

001.470

012.638

000.003

000.039

000.023

000.003

000.036

000.021

000.009

000.032

000.056

00348.442

01263.110

00393.000

- 20
- 21 Construction Exhaust Emissions per Phase
- 22 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

000.077

000.102

002.395

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

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1	H: Hours Worked per Day (hours)
2	EF _{POL} : Emission Factor for Pollutant (lb/hour)
3	2000: Conversion Factor pounds to tons
4	L
5	- Vehicle Exhaust Emissions per Phase
6	$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$
7	
8	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
9	BA: Area of Building (ft^2)
10	BH: Height of Building (ft)
11	$(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$
12	HT: Average Hauling Truck Round Trip Commute (mile/trip)
13	
14	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
15	
16	V _{POL} : Vehicle Emissions (TONs)
17	VMT _{ve} : Vehicle Exhaust Vehicle Miles Travel (miles)
18	0.002205: Conversion Factor grams to pounds
19	EF _{POL} : Emission Factor for Pollutant (grams/mile)
20	VM: Worker Trips On Road Vehicle Mixture (%)
21	2000: Conversion Factor pounds to tons
22	
23	- Worker Trips Emissions per Phase
24	$VMT_{WT} = WD * WT * 1.25 * NE$
25	
26	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
27	WD: Number of Total Work Days (days)
28	WT: Average Worker Round Trip Commute (mile)
29	1.25: Conversion Factor Number of Construction Equipment to Number of Works
30	NE: Number of Construction Equipment
31	
32	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
33	
34	V _{POL} : Vehicle Emissions (TONs)
35	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
36	0.002205: Conversion Factor grams to pounds
37	EF _{POL} : Emission Factor for Pollutant (grams/mile)
38	VM: Worker Trips On Road Vehicle Mixture (%)
39	2000: Conversion Factor pounds to tons
40	
41	- Vender Trips Emissions per Phase
42	$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
43	
44	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
45	BA: Area of Building (ft^2)
46	BH: Height of Building (ft)
47	$(0.38 / 1000)$: Conversion Factor ft ³ to trips $(0.38 \text{ trip} / 1000 \text{ ft}^3)$
48	HT: Average Hauling Truck Round Trip Commute (mile/trip)
49	
50	$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$
51	
52	V _{POL} : Vehicle Emissions (TONs)
52 53	VPOL. Vender Trips Vehicle Miles Travel (miles)
55 54	
	0.002205: Conversion Factor grams to pounds
55	EF _{POL} : Emission Factor for Pollutant (grams/mile)

Conversion tectural C nitectural rt Date fonth: puarter: fear: ration r of Mont r of Days: nitectural architectural ag Categon quare Foo r of Units	n Factor pou Coatings F I Coatings 7 1 2025 h: 6 : 0 I Coatings ral Coatings ry: N otage (ft ²): : N ngs Defaul	Phase Tin Phase As S Informat Von-Residen 735632 V/A t Settings	neline Ass sumptions ion	umptions		
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ural Coati t Settings	ngs Defaul	t Settings				
t Settings		-				
t Settings		-				
0	Useu:		Yes			
Day(s)			5 (default)			
	vorkeu per	WUCK.	(ucrault)			
rips						
-	Round Tr	ip Commu	te (mile):	20 (default))	
		-				
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itaatura	Conting	Dhogo Fr	viscion Foo	tor(a)		
mectura	Coatings	Phase En	lission rac	LOP(S)		
rins Emis	sion Factor	rs (grams/n	nile)			
VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pł
000.207	000.002	000.106	003.169	000.005	000.004	
000.211	000.003	000.188	003.599	000.006	000.006	
000.798	000.006	000.815	013.318	000.024	000.021	
000 075	000 001	000.081	003.102	000.003	000.002	
000.075	000.001		1	000 003	000.003	
000.077	000.001	000.120	002.148			
		000.120 002.283 000.686	002.148 001.470 012.638	000.039	000.036	
	rips Vehia LD0 50. nitectural rips Emis VOC 000.207 000.211 000.798	Trips Vehicle MixtureLDGVI 50.0° nitectural CoatingsTrips Emission FactorVOCSOx000.207000.002000.211000.03000.798000.06	Frips Vehicle Mixture (%) LDGV LDGT 50.00 50.00 nitectural Coatings Phase En rips Emission Factors (grams/n VOC SO. 000.207 000.002 000.106 000.211 000.003 000.188 000.798 000.006 000.815 000.075 000.001 000.081	Vehicle Mixture (%) LDGV LDGT HDGV 50.00 50.00 0 nitectural Coatings Phase Emission Factors (grams/mile) VOC SO _x NO _x CO 000.207 000.002 000.106 003.169 000.211 000.003 000.188 003.599 000.798 000.006 000.815 013.318 003.102	Vehicle Mixture (%) LDGV LDGT HDGV LDDV 50.00 50.00 0 0 nitectural Coatings Phase Emission Factor(s) rips Emission Factors (grams/mile) VOC SO _x NO _x CO PM 10 000.207 000.002 000.106 003.169 000.005 000.211 000.003 000.188 003.599 000.006 000.798 000.006 000.815 013.318 000.024 000.075 000.001 000.081 003.102 000.003	Vehicle Mixture (%) LDGV LDGT HDGV LDDV LDD' 50.00 50.00 0 0 0 0 stectural Coatings Phase Emission Factor(s) mitectural Coatings Phase Emission Factor(s) Prips Emission Factors (grams/mile) VOC SO _x NO _x CO PM 10 PM 2.5 000.207 000.002 000.106 003.169 000.005 000.004 000.211 000.003 000.188 003.599 000.006 000.021 000.798 000.006 000.815 013.318 000.024 000.021 000.075 000.001 000.081 003.102 000.003 000.002

HDDV

0

 \mathbf{NH}_3

000.024

000.026

000.051

000.008

000.009

000.056

MC

0

CO₂e

00294.554

00385.075

00883.115

00297.564 00348.442

01263.110 00393.000

- 41
- 42 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
- 43 1: Conversion Factor man days to trips (1 trip / 1 man * day)
- 44 WT: Average Worker Round Trip Commute (mile)

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1	PA: Paint Area (ft ²)	
2	800: Conversion Factor square feet to man days ($1 \text{ ft}^2 / 1 \text{ man } * \text{ day}$)
3		
4 5	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$	
6	V _{POL} : Vehicle Emissions (TONs)	
7	V_{POL} . Venter Emissions (1013) VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)	
8	0.002205: Conversion Factor grams to pounds	
9	EF _{POL} : Emission Factor for Pollutant (grams/mile)	
10	VM: Worker Trips On Road Vehicle Mixture (%)	
11	2000: Conversion Factor pounds to tons	
12		
13	- Off-Gassing Emissions per Phase	
14	$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$	
15		
16	VOC _{AC} : Architectural Coating VOC Emissions (TONs)	
17	BA: Area of Building (ft^2)	
18	2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / 0.0116 Existing Exists (11.02)	total area)
19 20	0.0116: Emission Factor (lb/ft^2)	
20 21	2000: Conversion Factor pounds to tons	
21	6.6 Paving Phase	
22	0.0 Taving Thase	
24	6.6.1 Paving Phase Timeline Assumptions	
25	or in the second s	
26	- Phase Start Date	
27	Start Month: 1	
28	Start Quarter: 1	
29	Start Year: 2025	
30		
31	- Phase Duration	
32	Number of Month: 12	
33	Number of Days: 0	
34 35	6.6.2 Paving Phase Assumptions	
35 36	0.0.2 Taving Thase Assumptions	
37	- General Paving Information	
38	Paving Area (ft^2): 95691	
39		
40	- Paving Default Settings	
41	Default Settings Used: Yes	
42	Average Day(s) worked per week: 5 (default)	
43		
44	- Construction Exhaust (default)	
	Equipment Name	Number Of
	Cement and Mortar Mixers Composite	Equipment 4
	Pavers Composite	1
	Paving Equipment Composite	2
	Rollers Composite	1
	Tractors/Loaders/Backhoes Composite	1
45	- Vehicle Exhaust	
46	Average Hauling Truck Round Trip Commute (mile): 20 (defa	ult)
47		

Hours Per Day

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MO
POVs	0	0	0	0	0	100.00	0
- Worker Tr	-	d Trin Comm	uto (milo):	20 (dofault)			
Average	ips Worker Roun ips Vehicle Mi	-	ute (mile):	20 (default)			
Average	Worker Roun	-	ute (mile):	20 (default)	LDDT	HDDV	M

6.6.3 Paving Phase Emission Factor(s)

8 9 10

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

Excavators Composite

Excavators Compos	ite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70	
Graders Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89	
Other Construction	Other Construction Equipment Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60	
Rubber Tired Dozers Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45	
Scrapers Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81	
Tractors/Loaders/Ba	ackhoes Co	mposite							
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO ₂ e	
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872	

11 12

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	Pb	\mathbf{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

13

14 **6.6.4 Paving Phase Formula(s)**

- 15
- 16 Construction Exhaust Emissions per Phase
- 17 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18
- 19 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 20 NE: Number of Equipment
- 21 WD: Number of Total Work Days (days)
- 22 H: Hours Worked per Day (hours)
- 23 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 24 2000: Conversion Factor pounds to tons

	Tehicle Exhaust Emissions per Phase $MT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$
	VMT Vahiele Exhaust Vahiele Miles Travel (miles)
	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 $(1 \text{ yd}^3/27 \text{ ft}^3)$
	HC: Average Hauling Truck Capacity (yd^3)
	$(1 / \text{HC})$: Conversion Factor cubic yards to trips $(1 \text{ trip } / \text{HC yd}^3)$
	HT: Average Hauling Truck Round Trip Commute (mile/trip)
VP	$_{OL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
	V _{POL} : Vehicle Emissions (TONs)
	V_{POL} . 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
	2000. Conversion ractor pounds to tons
- V	Vorker Trips Emissions per Phase
	$MT_{WT} = WD * WT * 1.25 * NE$
	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 Wo
	NE: Number of Construction Equipment
V _P	$_{OL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
	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
	$DC_P = (2.62 * PA) / 43560$
	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 / Domolition
1.	Construction / Demolition

- 52 County: Johnson
- 53 Regulatory Area(s): NOT IN A REGULATORY AREA54

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1 - Activity Title: Whiteman WGF

2	- Activity Hite.	Winternan WOI
3	- Activity Descript	tion:
4	See Section 2.1	
5		
6	- Activity Start Da	ite
7	Start Month:	1
8	Start Month:	2025
9		
10	- Activity End Dat	æ
11	Indefinite:	False
12	End Month:	12
13	End Month:	2025
14		
15	- Activity Emission	ns:
	Pollutant	Total Emissions (TONs)
	VOC	12.203511
	SO _x	0.038775
	NO _x	12.076403

Pollutant	Total Emissions (TONs)
PM 2.5	0.456718
Pb	0.000000
NH ₃	0.017791
CO ₂ e	4155.5

167.1 Site Grading Phase

CO

PM 10

18			
19	7.1.1 Site Grading Phase Timeline A	ssumptions	
20	C C	-	
21	- Phase Start Date		
22	Start Month: 1		
23	Start Quarter: 1		
24	Start Year: 2025		
25			
26	- Phase Duration		
27	Number of Month: 12		
28	Number of Days: 0		
29			
30	7.1.2 Site Grading Phase Assumptio	ns	
31			
32	- General Site Grading Information		
33	Area of Site to be Graded (ft ²):		2178000
34	Amount of Material to be Hauled O	n-Site (yd ³):	217
35	Amount of Material to be Hauled O	ff-Site (yd ³):	217
36			
37	- Site Grading Default Settings		
38	Default Settings Used:	Yes	
39	Average Day(s) worked per week:	5 (default)	
40			

14.360093

263.000689

41 - 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 Haul

3

4 5

6 7

8

9 10

11 12

13 14

- Average Hauling Truck Capacity (yd³):20 (default)
 - Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

· • • • • • • • • •	aust temerer						
	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 (%)

,, or more in the	pb veinere ivin						
	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

Graders Composite								
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozen	s Composit	te						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite	:							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Ba	ackhoes Co	mposite						
	VOC	SOx	NOx	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

15 16

- 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

17

18 **7.1.4 Site Grading Phase Formula(s)**

19

20 - Fugitive Dust Emissions per Phase

21 PM10_{FD} = (20 * ACRE * WD) / 2000 22

- 23 PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
- 24 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 25 ACRE: Total acres (acres)
- 26 WD: Number of Total Work Days (days)
- 27 2000: Conversion Factor pounds to tons

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1	- Construction Exhaust Emissions per Phase
2	$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
3	$CLEPOL = (I(L) \cap D) I(L) \cap D(POL) / Looo$
4	CEE _{POL} : Construction Exhaust Emissions (TONs)
5	NE: Number of Equipment
6	WD: Number of Total Work Days (days)
7	H: Hours Worked per Day (hours)
8	EF _{POL} : Emission Factor for Pollutant (lb/hour)
9	2000: Conversion Factor pounds to tons
10	-
11	- Vehicle Exhaust Emissions per Phase
12	$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
13	
14	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
15	HA _{OnSite} : Amount of Material to be Hauled On-Site (yd ³)
16	HA _{OffSite} : Amount of Material to be Hauled Off-Site (yd ³)
17	HC: Average Hauling Truck Capacity (yd ³)
18	$(1 / \text{HC})$: Conversion Factor cubic yards to trips $(1 \text{ trip} / \text{HC yd}^3)$
19	HT: Average Hauling Truck Round Trip Commute (mile/trip)
20	
21	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
22 23	V Vahiala Emissions (TONa)
25 24	V _{POL} : Vehicle Emissions (TONs) VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
24 25	0.002205: Conversion Factor grams to pounds
23 26	EF _{POL} : Emission Factor for Pollutant (grams/mile)
20 27	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
28	2000: Conversion Factor pounds to tons
29	2000. Conversion ractor pounds to tons
30	- Worker Trips Emissions per Phase
31	$VMT_{WT} = WD * WT * 1.25 * NE$
32	
33	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
34	WD: Number of Total Work Days (days)
35	WT: Average Worker Round Trip Commute (mile)
36	1.25: Conversion Factor Number of Construction Equipment to Number of Works
37	NE: Number of Construction Equipment
38	
39	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
40	
41	V _{POL} : Vehicle Emissions (TONs)
42	VMT _{wT} : Worker Trips Vehicle Miles Travel (miles)
43	0.002205: Conversion Factor grams to pounds
44	EF _{POL} : Emission Factor for Pollutant (grams/mile)
45 46	VM: Worker Trips On Road Vehicle Mixture (%)
46 47	2000: Conversion Factor pounds to tons
47 48	7.2 Trenching/Excavating Phase
48 49	7.2 Trenching/Excavating Thase
49 50	7.2.1 Trenching / Excavating Phase Timeline Assumptions
50 51	1.2.1 ITCHCHING / DACAVAUNG I HAST I INCHINE ASSUMPTIONS
52	- Phase Start Date
53	Start Month: 1
55 54	Start Quarter: 1

132.89

122.60

239.45

CO₂e

262.81

Equipment Excavators Composite 2 Other General Industrial Equipmen Composite 1	ys: 0 / Excavating Phase Assumptions ng/Excavating Information be Trenched/Excavated (ft ²): 21300 aterial to be Hauled On-Site (yd ³): 2.1 aterial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) haust (default) Equipment Name Number Of Hours Per Day Equipment 2 8 ustrial Equipmen Composite 1 8	Start Year	: 2025							
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 2.1 Default Settings Used: Yes Average Day(s) worked per week: 5 (default) - Construction Exhaust (default) Hours Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	ys: 0 / Excavating Phase Assumptions ng/Excavating Information be Trenched/Excavated (ft ²): 21300 aterial to be Hauled On-Site (yd ³): 2.1 aterial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) haust (default) Equipment Name Number Of Hours Per Day Equipment 2 8 ustrial Equipmen Composite 1 8	- Phase Duratio	on							
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 Excavators Composite 2 0ther General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1 1	/ Excavating Phase Assumptions ng/Excavating Information be Trenched/Excavated (ft ²): 21300 aterial to be Hauled On-Site (yd ³): 2.1 aterial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) naust (default) Equipment Name Number Of Equipment Diste 2 8 ustrial Equipment Composite 1 8	Number of	Month: 12							
• 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 • Trenching Default Settings 2.1 • Trenching Default Settings Yes Average Day(s) worked per week: 5 (default) • Construction Exhaust (default) Equipment Name Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	ng/Excavating Information be Trenched/Excavated (ft ²): 21300 interial to be Hauled On-Site (yd ³): 2.1 interial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) naust (default) Equipment Name Number Of Hours Per Day Equipment 2 8 ustrial Equipmen Composite 1 8	Number of	Days: 0							
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) Hours Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	be Trenched/Excavated (ft ²): 21300 aterial to be Hauled On-Site (yd ³): 2.1 aterial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) haust (default) 1 1 Desite 2 8 ustrial Equipment Composite 1 8	7.2.2 Trenchi	ng / Excavating	g Phase As	sumptions					
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) Hours Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	be Trenched/Excavated (ft ²): 21300 aterial to be Hauled On-Site (yd ³): 2.1 aterial to be Hauled Off-Site (yd ³): 2.1 It Settings gs Used: Yes s) worked per week: 5 (default) haust (default) 1 1 Desite 2 8 ustrial Equipment Composite 1 8	General Tren	ching/Excavating	g Informati	on					
Amount of Material to be Hauled Off-Site (yd³): 2.1 • Trenching Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default) • Construction Exhaust (default) • Construction Exhaust (default) • Hours Equipment • Excavators Composite 2 • 1 • Other General Industrial Equipmen Composite 1 • 1 • Tractors/Loaders/Backhoes Composite 1 • 1	Atterial to be Hauled Off-Site (yd³): 2.1 It Settings gs Used: Yes gs Used: Yes s) worked per week: 5 (default) haust (default) Hours Per Da Equipment Name Number Of Equipment Disite 2 8 ustrial Equipmen Composite 1 8					21300				
Trenching Default Settings Yes Default Settings Used: Yes Average Day(s) worked per week: 5 (default) Construction Exhaust (default) Hours Equipment Name Number Of Equipment Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	It Settings gs Used: Yes s) worked per week: 5 (default) naust (default) Equipment Name Number Of Hours Per Da Equipment osite 2 8 ustrial Equipmen Composite 1 8									
Default Settings Used: Yes Average Day(s) worked per week: 5 (default) Construction Exhaust (default) Number Of Hours Equipment Name Number Of Hours Equipment 2 0 Other General Industrial Equipmen Composite 1 1 Tractors/Loaders/Backhoes Composite 1 1	s Used: Yes s) worked per week: 5 (default) haust (default) Equipment Name Number Of Hours Per Da Equipment bosite 2 8 ustrial Equipmen Composite 1 8				She (yu).	2.1				
Average Day(s) worked per week: 5 (default) Construction Exhaust (default) Number Of Equipment Equipment Name Number Of Equipment Excavators Composite 2 Other General Industrial Equipmen Composite 1 Tractors/Loaders/Backhoes Composite 1	s) worked per week: 5 (default) haust (default) Equipment Name Number Of Hours Per Da Equipment Disite 2 8 ustrial Equipmen Composite 1 8				17					
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Excavators Composite2Other General Industrial Equipmen Composite1Tractors/Loaders/Backhoes Composite1	osite 2 8 ustrial Equipmen Composite 1 8		Equip	ment manie	;				nours	rerDa
Tractors/Loaders/Backhoes Composite 1										
	Backhoes Composite 1 8	Other Concert	Industrial Equipm	nen Compos	ite					
Vehicle Exhaust				-						8
- Vehicle Exhaust Vehicle Mixture (%) LDGV LDGT HDGV LDDV LDDT HDDV		Tractors/Loade - Vehicle Exhau Average H Average H	ers/Backhoes Con ust auling Truck Ca auling Truck Ro	pacity (yd ³) ound Trip C			efault) efault)	1		0
	Vehicle Mixture (%)	Tractors/Loade Vehicle Exhau Average H Average H	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu	pacity (yd ³) und Trip C ure (%)	ommute (m	ile): 20 (d	efault)		IDDV	
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Average Worker Round Trip Commute (mile): 20 (default)	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 ker Round Trip Commute (mile): 20 (default)	Tractors/Loade Vehicle Exhat Average H Average H Overage H POVs Worker Trips Average W	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 5 Vorker Round Tr	pacity (yd ³) und Trip C ure (%) LDGT 0	ommute (m HDGV 0	ile): 20 (c	efault) LDI 0	DT H		MC
Average Worker Round Trip Commute (mile): 20 (default) Worker Trips Vehicle Mixture (%) LDGV LDGT HDGV LDDV HDDV	Vehicle Mixture (%) HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 ker Round Trip Commute (mile): 20 (default) chicle Mixture (%) LDDV LDDT HDDV MC DGV LDGT HDGV LDDV MC MC	Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips Average W Worker Trips	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr s Vehicle Mixture LDGV 1	pacity (yd ³) und Trip C LDGT 0 	ommute (m HDGV 0 te (mile):	ile): 20 (d LDDV 0 20 (default)	efault)	DT H 1	00.00	MC 0
		Tractors/Loade	ers/Backhoes Con ust auling Truck Ca	pacity (yd ³)				1		0
		Tractors/Loade - Vehicle Exhau Average H Average H	ers/Backhoes Con ust auling Truck Ca auling Truck Ro	pacity (yd ³) ound Trip C				1		0
	Vehicle Mixture (%)	Tractors/Loade - Vehicle Exhau Average H Average H	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu	pacity (yd ³) und Trip C ure (%)	ommute (m	ile): 20 (d	efault)		IDDV	
	Vehicle Mixture (%) DGV LDGT HDGV LDDV HDDV MC	Tractors/Loade Vehicle Exhar Average H Average H Vehicle Exhar	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I	pacity (yd ³) ound Trip C ure (%) LDGT	ommute (m HDGV	ile): 20 (d	efault)	DT H		MC
Worker Trips	Vehicle Mixture (%) DGV LDGT HDGV LDDV HDDV MC	Tractors/Loader Vehicle Exhan Average H Vehicle Exhan POVs	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0	pacity (yd ³) ound Trip C ure (%) LDGT	ommute (m HDGV	ile): 20 (d	efault)	DT H		MC
	Vehicle Mixture (%) LDGT HDGV LDDT HDDV MC 0 0 0 0 0 0 0	Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I 0	pacity (yd ³) ound Trip C ure (%) LDGT 0	ommute (m HDGV 0	ile): 20 (c	efault) LDI 0	DT H		MC
Average Worker Round Trip Commute (mile): 20 (default)	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 ker Round Trip Commute (mile): 20 (default)	Tractors/Loade - Vehicle Exhau Average H - Vehicle Exhau POVs - Worker Trips Average W	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 5 Vorker Round Tr	pacity (yd ³) und Trip C ure (%) LDGT 0	ommute (m HDGV 0	ile): 20 (c	efault) LDI 0	DT H		MC
Average Worker Round Trip Commute (mile): 20 (default) • Worker Trips Vehicle Mixture (%) LDGV LDGT HDGV LDDV	Vehicle Mixture (%) HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 ker Round Trip Commute (mile): 20 (default) chicle Mixture (%) LDDV LDDT HDDV MC DGV LDGT HDGV LDDV MC MC	Tractors/Loade • Vehicle Exhat Average H Average H • Vehicle Exhat POVs • Worker Trips Average W • Worker Trips	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr s Vehicle Mixture LDGV 1	pacity (yd ³) und Trip C LDGT 0 	bommute (m HDGV 0 te (mile): HDGV	ile): 20 (c LDDV 0 20 (default) LDDV	efault) LDI 0 LDI	DT H 1 DT H	00.00	<u>МС</u> 0 МС
Average Worker Round Trip Commute (mile): 20 (default) - Worker Trips Vehicle Mixture (%)	Vehicle Mixture (%) HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 ker Round Trip Commute (mile): 20 (default) 20 (default) 20 (default) 20 (default) chicle Mixture (%) LDGT HDGV LDDV LDDT HDDV MC	Tractors/Loade - Vehicle Exhat Average H Average H - Vehicle Exhat POVs - Worker Trips Average W - Worker Trips	ers/Backhoes Con ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr s Vehicle Mixture LDGV 1	pacity (yd ³) und Trip C LDGT 0 	bommute (m HDGV 0 te (mile): HDGV	ile): 20 (c LDDV 0 20 (default) LDDV	efault) LDI 0 LDI	DT H 1 DT H	00.00	<u>МС</u> 0
Average Worker Round Trip Commute (mile): 20 (default)Worker Trips Vehicle Mixture (%)HDGVLDDVHDDVLDGVLDGTHDGVLDDVLDDTHDDVPOVs50.0050.000000	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 cer Round Trip Commute (mile): 20 (default)	Tractors/Loade - Vehicle Exhat Average H - Vehicle Exhat POVs - Worker Trips Average W - Worker Trips POVs	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 5 Vorker Round Tr s Vehicle Mixture LDGV 1 50.00	pacity (yd ³) ound Trip C LDGT 0 rip Commute e (%) LDGT 50.00	HDGV 0 te (mile): <u>HDGV</u> 0	ile): 20 (c LDDV 0 20 (default) LDDV 0	efault) LDI 0 LDI	DT H 1 DT H	00.00	<u>МС</u> 0
Average Worker Round Trip Commute (mile): 20 (default) • Worker Trips Vehicle Mixture (%) • UDGV LDGT HDGV LDDV LDDT HDDV POVs 50.00 50.00 0 0 0 0 7.2.3 Trenching / Excavating Phase Emission Factor(s) Factor (s) Factor (s) Factor (s) Factor (s)	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 xer Round Trip Commute (mile): 20 (default)	 Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi 	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I 0 Vorker Round Tr s Vehicle Mixture LDGV I 50.00 ing / Excavating	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er	http://www.commute.commute.commute.commute.com/ 0 te (mile): http://www.commute.com/ 0 nission Fac	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s)	efault) LDI 0 LDI	DT H 1 DT H	00.00	<u>MC</u> 0 MC
Average Worker Round Trip Commute (mile): 20 (default) • Worker Trips Vehicle Mixture (%) •	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 acer Round Trip Commute (mile): 20 (default) 20 (default) 20 (default) 20 (default) chicle Mixture (%) DGV LDGT HDGV MC 20 (default) bicle Mixture (%) DGV LDDT HDDV MC 50.00 50.00 0 0 0 0 / Excavating Phase Emission Factor(s) 100 (default) 100 (default) 100 (default)	Tractors/Loade Vehicle Exhat Average H Average H Average H POVs Worker Trips Average W Worker Trips POVs OVs OVs Average W OVs Overage W Overage N	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr S Vehicle Mixture LDGV 1 50.00 ing / Excavating Exhaust Emissio	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er	http://www.commute.commute.commute.commute.com/ 0 te (mile): http://www.commute.com/ 0 nission Fac	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s)	efault) LDI 0 LDI	DT H 1 DT H	00.00	<u>MC</u> 0 MC
Average Worker Round Trip Commute (mile): 20 (default) Worker Trips Vehicle Mixture (%) LDGV LDGV LDDT HDDV POVs 50.00 50.00 0 0 0 0 POVs 50.00 50.00 0 0 0 0 0 7.2.3 Trenching / Excavating Phase Emission Factors (lb/hour) (default) Construction Exhaust Emission Factors (lb/hour) (default) Emission Factors (lb/hour) (default)	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 acr Round Trip Commute (mile): 20 (default)	Tractors/Loade Vehicle Exhat Average H Average H Average H POVs Worker Trips Average W Worker Trips POVs OVerage W Average W Average W OVs OVs OVs Overage W OVs Overage W Overage W Overage N Overage N<	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr s Vehicle Mixture LDGV 1 50.00 ing / Excavating Exhaust Emissio posite	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commute e (%) LDGT 50.00 g Phase Er on Factors (bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s) fault)	efault)	DT H DT H	00.00 IDDV 0	<u>МС</u> 0 <u>МС</u> 0
Average Worker Round Trip Commute (mile): 20 (default) • Worker Trips Vehicle Mixture (%) •	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 cer Round Trip Commute (mile): 20 (default) 20	Tractors/Loade Vehicle Exhat Average H Average H • Vehicle Exhat POVs • Worker Trips Average W • Worker Trips POVs • Worker Trips POVs • Worker Trips POVs • Construction Graders Com	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 Vorker Round Tr s Vehicle Mixture LDGV 1 50.00 ing / Excavating Exhaust Emissio posite VOC	pacity (yd ³) und Trip C ure (%) LDGT 0 	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s) fault) CO	efault)	DT H DT H DT H PM 2.5	00.00	MC 0 MC 0
Average Worker Round Trip Commute (mile): 20 (default)• Worker Trips Vehicle Mixture (%) $IDGV$ $IDGV$ $IDDV$ $HDDV$ POVs 50.00 50.00 0 0 0 0 7.2.3 Trenching / Excavating Phase Emission Factor(s)Construction Exhaust Emission Factors (lb/hour) (default)Graders CompositeVOCSO _x NO _x COPM 10PM 2.5CH4Emission Factors0.06760.00140.01470.0147	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 cer Round Trip Commute (mile): 20 (default) 20	 Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi Construction Graders Com 	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I 0 Vorker Round Tr s Vehicle Mixture LDGV I 50.00 ing / Excavating Exhaust Emissio posite VOC ors 0.0676	pacity (yd ³) ound Trip C ure (%) LDGT 0 ip Commute e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014	HDGV 0 0 0 te (mile): HDGV 0 0 nission Fac Ib/hour) (de NOx 0.3314	ile): 20 (c LDDV 0 20 (default) LDDV 0 ctor(s) fault) CO	efault)	DT H DT H DT H PM 2.5	00.00	MC 0 MC 0
Average Worker Round Trip Commute (mile): 20 (default) • Worker Trips Vehicle Mixture (%) •	Vehicle Mixture (%) DGV $LDGT$ $HDGV$ $LDDV$ $LDDT$ $HDDV$ MC 0000000 cer Round Trip Commute (mile):20 (default)Schiele Mixture (%) DGV $LDGT$ $HDGV$ $LDDV$ $LDDT$ $HDDV$ MC 50.00 50.0000000/ Excavating Phase Emission Factor(s)naust Emission Factors (lb/hour) (default)iteVOCSOxNOxCOPM 10PM 2.5CH4CO20.06760.00140.33140.56950.01470.01470.0061132.8on Equipment Composite	 Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi Construction Graders Com 	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I 0 Vorker Round Tr s Vehicle Mixture LDGV I 50.00 ing / Excavating Exhaust Emissio posite VOC ors 0.0676 uction Equipmen	pacity (yd ³) ound Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014 at Composit	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695	efault)	DT H	00.00 IDDV 0 CH4 0.0061	МС 0 МС 0
Average Worker Round Trip Commute (mile): 20 (default)- Worker Trips Vehicle Mixture (%)-IDGVIDDVIDDVHDDVPOVs 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 CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission Factors 0.0676 0.0014 0.3314 0.5695 0.0147 0.0147 0.0061	Vehicle Mixture (%) JOGV LDGT HDGV LDDV LDDT HDDV MC 0	Tractors/Loade Vehicle Exhat Average H Average H Vehicle Exhat POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi Construction Graders Com Emission Factor Other Construction	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 1 0 5 /orker Round Tr s Vehicle Mixture LDGV 1 50.00 5 ing / Excavating Exhaust Emissio posite VOC ors 0.0676 uction Equipmen VOC	pacity (yd ³) ound Trip C ure (%) LDGT 0 'ip Commute e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014 it Composite SO _x	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (efault)	DT H 1 1 DT H 0T H 0T <td>00.00 HDDV 0 CH4 0.0061 CH4</td> <td>МС 0 МС 0 0 132.8 СО2</td>	00.00 HDDV 0 CH4 0.0061 CH4	МС 0 МС 0 0 132.8 СО2
Average Worker Round Trip Commute (mile): 20 (default)Worker Trips Vehicle Mixture (%)LDGVLDGVLDDVHDDVPOVs 50.00 50.00 0 0 0 0 7.2.3 Trenching / Excavating Phase Emission Factor(s)Construction Exhaust Emission Factors (lb/hour) (default)Graders CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission FactorsOther Construction Equipment CompositeVOCSOxNOxCOPM 10PM 2.5CH4Conter Construction Equipment CompositeVOCSOxNOxCOPM 10PM 2.5CH4Other Construction Equipment CompositeVOCSOxNOxCOPM 10PM 2.5CH4	Vehicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 Comparent Composite A HDGV LDDT HDDV MC 0 0 0 0 0 0 0 A trip Commute (mile): 20 (default) Schicle Mixture (%) DGV LDGT HDGV LDDV LDDT HDDV MC Solution of the trip Commute (mile): 20 (default) Body LDDV LDDT HDDV MC 50.00 50.00 0 <t< th=""><td>Tractors/Loade Vehicle Exhau Average H Average H POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi Construction Graders Com Emission Factor Cother Construction</td><td>ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixture LDGV I 0 5 7 orker Round Tr 5 Vehicle Mixture LDGV I 50.00 ing / Excavating Exhaust Emissio posite VOC ors 0.0676 uction Equipmen VOC ors 0.0442</td><td>pacity (yd³) ound Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er on Factors (SO_x 0.0014 at Composit SO_x 0.0012</td><td>bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te NOx</td><td>ile): 20 (c LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (</td><td>efault)</td><td>DT H 1 1 DT H 0T H 0T<td>00.00 HDDV 0 CH4 0.0061 CH4</td><td>МС 0 МС 0 0 132.8 СО2</td></td></t<>	Tractors/Loade Vehicle Exhau Average H Average H POVs Worker Trips Average W Worker Trips POVs 7.2.3 Trenchi Construction Graders Com Emission Factor Cother Construction	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixture LDGV I 0 5 7 orker Round Tr 5 Vehicle Mixture LDGV I 50.00 ing / Excavating Exhaust Emissio posite VOC ors 0.0676 uction Equipmen VOC ors 0.0442	pacity (yd ³) ound Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014 at Composit SO _x 0.0012	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 20 (default) 20 (efault)	DT H 1 1 DT H 0T H 0T <td>00.00 HDDV 0 CH4 0.0061 CH4</td> <td>МС 0 МС 0 0 132.8 СО2</td>	00.00 HDDV 0 CH4 0.0061 CH4	МС 0 МС 0 0 132.8 СО2
Average Worker Round Trip Commute (mile): 20 (default)Worker Trips Vehicle Mixture (%)LDGVLDGTHDDV OVs 50.0050.00000POVs50.0050.00007.2.3 Trenching / Excavating Phase Emission Factor(s)Construction Exhaust Emission Factors (lb/hour) (default)Graders CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission Factors0.06760.00140.33140.56950.01470.01470.0061Other Construction Equipment CompositeFunction Equipment CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission Factors0.04420.00120.20210.34730.00680.00680.0039	Vehicle Mixture (%) LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 acer Round Trip Commute (mile): 20 (default) <	Tractors/Loade Vehicle Exhat Average H Average H Average H Average H POVs Worker Trips Average W Worker Trips POVs POVs Overage W POVs POVs POVs Emission Facto Other Construction Emission Facto Emission Facto	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV I 0 S Vorker Round Tr S Vehicle Mixture LDGV I 50.00 ing / Excavating Exhaust Emissio posite VOC ors 0.0676 uction Equipmen VOC ors 0.0442 Dozers Composite	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commute e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014 nt Composit SO _x 0.0012 ite	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te NOx 0.2021	ile): 20 (c LDDV 0 20 (default) 20 (default) 0 ctor(s) fault) CO 0.5695 CO 0.3473	efault)	DT H	00.00 IDDV 0 CH4 0.0061 CH4 0.0039	МС 0 МС 0 0 132.8 СО2 122.6
Average Worker Round Trip Commute (mile): 20 (default)Worker Trips Vehicle Mixture (%) $UDGV$ $LDGT$ $HDGV$ $LDDT$ $HDDV$ POVs 50.00 50.00 0 0 0 7.2.3 Trenching / Excavating Phase Emission Factor(s)Construction Exhaust Emission Factors (lb/hour) (default)Graders CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission Factors 0.0676 0.0014 0.3314 0.5695 0.0147 0.0147 0.0061 Other Construction Equipment CompositeVOCSOxNOxCOPM 10PM 2.5CH4Emission Factors 0.0442 0.0012 0.2021 0.3473 0.0068 0.0068 0.0039 Rubber Tired Dozers Composite	Vehicle Mixture (%) LDGT HDGV LDDV LDDT HDDV MC 0 0 0 0 0 0 0 0 acer Round Trip Commute (mile): 20 (default) <	Tractors/Loade Vehicle Exhat Average H Average H Average H POVs Worker Trips Average W Worker Trips POVs Other Trips POVs Average W Orker Trips POVs Other Construction Graders Com Emission Facto Other Constructor Emission Facto Rubber Tired	ers/Backhoes Com ust auling Truck Ca auling Truck Ro ust Vehicle Mixtu LDGV 0 5 Vorker Round Tr 5 Vehicle Mixture LDGV 5 5 0 s Vehicle Mixture LDGV 5 0 1 1 1 1 1 1 1 1 1 1 1 1 1	pacity (yd ³) und Trip C ure (%) LDGT 0 ip Commut e (%) LDGT 50.00 g Phase Er on Factors (SO _x 0.0014 nt Composit SO _x 0.0012 ite SO _x	bommute (m HDGV 0 te (mile): HDGV 0 nission Fac lb/hour) (de NOx 0.3314 te NOx 0.2021 NOx	ile): 20 (c LDDV 0 20 (default) 20 (default) 1 20 (default) 0 20 (default) 20 (default) 0 20 (default) 20 (def	efault)	DT H DT <td>00.00 IDDV 0 CH4 0.0061 CH4 0.0039 CH4</td> <td>MC 0 MC 0 0 132.8 CO₂₄ 122.6</td>	00.00 IDDV 0 CH4 0.0061 CH4 0.0039 CH4	MC 0 MC 0 0 132.8 CO ₂₄ 122.6

VOC

0.1495

Emission Factors

SO_x

0.0026

NO_x

0.8387

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

CH₄

0.0134

PM 2.5

0.0334

PM 10

0.0334

СО

0.7186

Tractors/Loaders/Ba	ackhoes Co	mposite						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO ₂ e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

1 2

B-200

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

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

³ 4

5 6

7

8 9

12

13

14

17

23

24

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)
- 10 20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
- 11 ACRE: Total acres (acres)
 - WD: Number of Total Work Days (days)
 - 2000: Conversion Factor pounds to tons

15 -	Construction	Exhaust	Emissions	per Phase

- 16 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
 - 2000: Conversion Factor pounds to tons
- 25 Vehicle Exhaust Emissions per Phase
- 26 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$
- 27 28 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 29 HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) 30 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) 31 HC: Average Hauling Truck Capacity (yd³) 32 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) 33 HT: Average Hauling Truck Round Trip Commute (mile/trip) 34 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 35 36 VPOL: Vehicle Emissions (TONs) 37 38 VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 39 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) 40 41 VM: Vehicle Exhaust On Road Vehicle Mixture (%) 42 2000: Conversion Factor pounds to tons

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-	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 Nur	nber of Works	
	NE: Number of Construction Equipment		
v	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$		
	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	7.3 Building Construction Phase		
1			
7	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		
1	7.5.2 Bunding Constituction I hase 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
ľ	Cranes Composite	1	7
Ī	Forklifts Composite	3	8
	Generator Sets Composite	1	8
Γ	Tractors/Loaders/Backhoes Composite	3	7
L	Welders Composite	1	8

Average Hauling Truck Round Trip Commute (mile): 47 20 (default)

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	LDO	hicle Mixtu V I	DGT	HDGV	LDDV	LDI		HDDV	M
POVs	0		0	0	0	0		100.00	0
1013	0		0	0	U	0	I	100.00	0
Worker '	Trips								
		Round Tri	p Commut	e (mile):	20 (default)			
	8		r	- ()+	_ (/			
Worker '	Frips Vehi	ele Mixture	(%)						
			DGT	HDGV	LDDV	LDI	DT I	HDDV	M
POVs	50.	00 4	50.00	0	0	0		0	0
• Vendor 7									
Avera	ge Vendor	Round Tri	p Commute	e (mile):	40 (default)			
			(24)						
• Vendor '		le Mixture		IIDON	IDDU	IDI			3.74
DOM			DGT	HDGV				HDDV	MO
POVs	0		0	0	0	0		100.00	0
			Phase Emi	• •					
C		4 F	. F 4 (1	L /L) (] -	614)				
	ction Exhau Composite	ist Emissio	n Factors (l	b/hour) (de	etault)				
Cranes C	omposite	NOC	60	NO	CO	DM 10	DM 2 5	CII	
Emission	Fastara	VOC 0.0680	SO x 0.0013	NO x 0.4222	CO 0.3737	PM 10 0.0143	PM 2.5 0.0143	CH4 0.0061	C 128
	Composite		0.0015	0.4222	0.3737	0.0145	0.0145	0.0001	120
TUINIII	Composite	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH ₄	C
Emission	Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.
	r Sets Con		0.0000	0.0057	0.2147	0.0025	0.0025	0.0021	
Generati		VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.
		ackhoes Co		0.2323	0.2000	0.0000	0.0000	0.0025	01.
	2000010/2	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.
	Composite			0.2007					
		VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	C
Emission	Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.
Linission		J						1	
Liiiissioii						、 、			
	Exhaust & `	Worker Tri	ips Emissio	n Factors (grams/mile)			
	Exhaust & VOC	Worker Tri SO _x	ips Emissio NO _x	n Factors () CO	grams/mile PM 10	PM 2.5	Pb	NH ₃	CO
							Pb	NH ₃ 000.024	
· Vehicle F	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb		00294
• Vehicle F LDGV	VOC 000.207	SO _x 000.002	NO _x 000.106	CO 003.169	PM 10 000.005	PM 2.5 000.004	Pb	000.024	00294 00385
• Vehicle F LDGV LDGT	VOC 000.207 000.211	SO _x 000.002 000.003	NO _x 000.106 000.188	CO 003.169 003.599	PM 10 000.005 000.006	PM 2.5 000.004 000.006	Pb	000.024 000.026	00294 00385 00883
• Vehicle F LDGV LDGT HDGV	VOC 000.207 000.211 000.798	SOx 000.002 000.003 000.006	NOx 000.106 000.188 000.815	CO 003.169 003.599 013.318	PM 10 000.005 000.006 000.024	PM 2.5 000.004 000.006 000.021	Pb	000.024 000.026 000.051	CO 00294 00385 00883 00297 00348

18

HDDV

MC

19 **7.3.4 Building Construction Phase Formula(s)**

000.004

000.003

002.283

000.686

001.470

012.638

000.039

000.023

000.036

000.021

000.032

000.056

01263.110

00393.000

20 - Construction Exhaust Emissions per Phase

21 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

000.102

002.395

- 22
- 23 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 24 NE: Number of Equipment
- 25 WD: Number of Total Work Days (days)

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1	H: Hours Worked per Day (hours)
2	EF _{POL} : Emission Factor for Pollutant (lb/hour)
3	2000: Conversion Factor pounds to tons
4	-
5	- Vehicle Exhaust Emissions per Phase
6	$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$
7	
8	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
9	BA: Area of Building (ft ²)
10	BH: Height of Building (ft)
11	$(0.42 / 1000)$: Conversion Factor ft ³ to trips $(0.42 \text{ trip} / 1000 \text{ ft}^3)$
12	HT: Average Hauling Truck Round Trip Commute (mile/trip)
13	mit. Morage maaning mack Round mit commate (mite/unp)
13	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
15	$V_{POL} = (V_{POL} + V_{POL} + V_{$
15	V _{POL} : Vehicle Emissions (TONs)
10	V_{POL} . Vehicle Exhaust Vehicle Miles Travel (miles)
17	
	0.002205: Conversion Factor grams to pounds
19 20	EF _{POL} : Emission Factor for Pollutant (grams/mile)
20	VM: Worker Trips On Road Vehicle Mixture (%)
21	2000: Conversion Factor pounds to tons
22	
23	- Worker Trips Emissions per Phase
24	$VMT_{WT} = WD * WT * 1.25 * NE$
25	
26	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
27	WD: Number of Total Work Days (days)
28	WT: Average Worker Round Trip Commute (mile)
29	1.25: Conversion Factor Number of Construction Equipment to Number of Works
30	NE: Number of Construction Equipment
31	
32	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
33	
34	V _{POL} : Vehicle Emissions (TONs)
35	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
36	0.002205: Conversion Factor grams to pounds
37	EF _{POL} : Emission Factor for Pollutant (grams/mile)
38	VM: Worker Trips On Road Vehicle Mixture (%)
39	2000: Conversion Factor pounds to tons
40	
41	- Vender Trips Emissions per Phase
42	$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$
43	
44	VMT _{VT} : Vender Trips Vehicle Miles Travel (miles)
45	BA: Area of Building (ft ²)
46	BH: Height of Building (ft)
47	$(0.38 / 1000)$: Conversion Factor ft ³ to trips $(0.38 \text{ trip} / 1000 \text{ ft}^3)$
48	HT: Average Hauling Truck Round Trip Commute (mile/trip)
49	
50	$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$
51	
52	V _{POL} : Vehicle Emissions (TONs)
53	VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)
54	0.002205: Conversion Factor grams to pounds
55	EF_{POL} : Emission Factor for Pollutant (grams/mile)

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VM: Worker Trips On Road Vehicle Mixture (%)							
2000: Conversion Factor pounds to tons							
7.4 Architectural Coatings Phase							
		a	DI TI				
7.4.1 A	rchitectural	Coatings	Phase Tin	neline Ass	umptions		
Dhaca (Start Date						
		6					
		1					
	-	2025					
- Phase I	Duration						
Nun	nber of Mont	h: 6					
Nun	iber of Days:	: 0					
7.4.2 A	rchitectural	Coatings	Phase Ass	sumptions			
	l Architectu						
	ding Categor		on-Residen	tial			
	l Square Foo						
Nun	nber of Units	: N	/A				
- Architectural Coatings Default Settings							
			-	Vas			
Defa	ult Settings	Used:	, in the second s	Yes (default)			
Defa		Used:	, in the second s	Yes 5 (default)			
Defa Ave	ult Settings rage Day(s) v	Used:	, in the second s				
Defa Ave - Worke	ult Settings T rage Day(s) v r Trips	Used: vorked per	week: 5	6 (default)	20 (default)	
Defa Aver - Worke Aver	uult Settings rage Day(s) v r Trips rage Worker	Used: vorked per Round Tri	week: 5	6 (default)	20 (default)	
Defa Aver - Worke Aver	uult Settings rage Day(s) v r Trips rage Worker r Trips Vehio	Used: vorked per Round Tri cle Mixture	week: 5	e (mile):			
Defa Aver - Worke Aver - Worke	nult Settings rage Day(s) v r Trips rage Worker <u>r Trips Vehio</u> LDO	Used: vorked per Round Tri cle Mixture GV L	week: 5 p Commut (%) DGT	i (default) e (mile): HDGV	LDDV	LDD	DT
Defa Aver - Worke Aver	uult Settings rage Day(s) v r Trips rage Worker r Trips Vehio	Used: vorked per Round Tri cle Mixture GV L	week: 5	e (mile):			DT
Defa Aver - Worke - Worke POVs	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehio LDC 50.0	Used: vorked per Round Tri <u>cle Mixture</u> GV L 00 <u></u>	week: 5 p Commut (%) _DGT _50.00	<pre>6 (default) e (mile): HDGV 0</pre>	LDDV 0	LDD)T
Defa Aver - Worke - Worke POVs	nult Settings rage Day(s) v r Trips rage Worker <u>r Trips Vehio</u> LDO	Used: vorked per Round Tri <u>cle Mixture</u> GV L 00 <u></u>	week: 5 p Commut (%) _DGT _50.00	<pre>6 (default) e (mile): HDGV 0</pre>	LDDV 0	LDD	9T
Defa Aver - Worke Aver - Worke POVs 7.4.3 A	nult Settings rage Day(s) v r Trips rage Worker <u>r Trips Vehic</u> <u>LD(</u> 50.4	Used: vorked per Round Tri ele Mixture GV L 00	week: 5 p Commut (%) DGT 50.00 Phase Em	i (default) e (mile): HDGV 0 iission Fac	LDDV 0	LDD	0T
Defa Aver - Worke Aver - Worke POVs 7.4.3 A	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehio LDC 50.0	Used: vorked per Round Tri ele Mixture GV L 00	week: 5 p Commut (%) DGT 50.00 Phase Em	i (default) e (mile): HDGV 0 iission Fac	LDDV 0	LDD	
Defa Aver - Worke Aver - Worke POVs 7.4.3 A	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehio LDO 50.0 rchitectural r Trips Emis	Used: vorked per Round Tri cle Mixture GV L 00 4 Coatings sion Factor	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m	idefault) e (mile): HDGV 0 iission Fac	LDDV 0 tor(s)	LDD 0	Pb
Defa Aver - Worke - Worke POVs 7.4.3 A - Worke	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehic 50.0 rchitectural r Trips Emis VOC	Used: vorked per Round Tri cle Mixture GV L 00 5 Coatings sion Factor SO _x	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x	ission Fac	LDDV 0 tor(s) PM 10	LDD 0 PM 2.5	
Defa Aver - Worke - Worke POVs 7.4.3 A - Worke	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehic 50. rchitectural r Trips Emis VOC 000.207 000.211 000.798	Used: vorked per Round Tri Ele Mixture GV L 00 5 Coatings sion Factor SO _x 000.002 000.003 000.006	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106	 i (default) i (defau	LDDV 0 tor(s) PM 10 000.005	LDD 0 000.004 000.006 000.021	
Defa Aver - Worke POVs 7.4.3 A - Worke LDGV LDGT HDGV LDDV	nult Settings rage Day(s) v r Trips rage Worker r Trips Vehic 50. rchitectural r Trips Emis VOC 000.207 000.211	Used: vorked per Round Tri <u>ele Mixture</u> <u>SV L</u> 00 <u><u><u></u></u> Coatings sion Factor <u>SO_x</u> 000.002 000.003</u>	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106 000.188	(default) e (mile): HDGV 0 iission Fac iile) 003.169 003.599	LDDV 0 tor(s) PM 10 000.005 000.006	LDD 0 9 000.004 000.006	
Defa Aver - Worke POVs 7.4.3 A - Worke LDGV LDGT HDGV LDDV LDDT	Voc 000.207 000.075	Used: vorked per Round Tri Cle Mixture GV L 00 2 Coatings sion Factor SO _x 000.002 000.003 000.006 000.001 000.001	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106 000.188 000.815 000.081 000.120	 idefault) idefault) idefault) image: mile mile mile mile mile mile mile mile	LDDV 0 tor(s) PM 10 000.005 000.006 000.024 000.003	LDD 0	
Defa Aver - Worke POVs 7.4.3 A - Worke LDGV LDGT HDGV LDDV LDDT HDDV	VOC 000.207 000.077 000.102	Used: vorked per Round Tri Cle Mixture GV L 00 5 Coatings sion Factor SO _x 000.002 000.003 000.001 000.001 000.004	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106 000.188 000.815 000.081 000.120 002.283	 idefault) idefault) image: mile) image: mile	LDDV 0 tor(s) PM 10 000.005 000.006 000.003 000.003 000.039	LDD 0 0 000.004 000.004 000.002 000.003 000.036	
Defa Aver - Worke POVs 7.4.3 A - Worke LDGV LDGT HDGV LDDV LDDT	Voc 000.207 000.075	Used: vorked per Round Tri Cle Mixture GV L 00 2 Coatings sion Factor SO _x 000.002 000.003 000.006 000.001 000.001	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106 000.188 000.815 000.081 000.120	 idefault) idefault) idefault) image: mile mile mile mile mile mile mile mile	LDDV 0 tor(s) PM 10 000.005 000.006 000.024 000.003	LDD 0	
Defa Aver - Worke POVs 7.4.3 A - Worke LDGV LDGT HDGV LDDT HDDV MC	VOC 000.207 000.077 000.102	Used: vorked per Round Tri Cle Mixture GV L 00 2 Coatings sion Factor SO _x 000.002 000.003 000.003 000.001 000.001 000.004 000.003	week: 5 p Commut (%) DGT 50.00 Phase Em s (grams/m NO _x 000.106 000.188 000.815 000.081 000.120 002.283 000.686	idefault) idefault) ie (mile): HDGV 0 iission Fact iile) CO 003.169 003.102 003.102 002.148 001.470 012.638	LDDV 0 tor(s) PM 10 000.005 000.006 000.003 000.003 000.039	LDD 0 0 000.004 000.004 000.002 000.003 000.036	

HDDV

0

 \mathbf{NH}_3

000.024

000.026

000.051

000.008

000.009

000.056

MC

0

CO₂e

00294.554

00385.075

00883.115

00297.564 00348.442

01263.110 00393.000

- 42 VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
- 43 1: Conversion Factor man days to trips (1 trip / 1 man * day)
- 44 WT: Average Worker Round Trip Commute (mile)

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1 2	PA: Paint Area (ft^2) 800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)
3	
4 5	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
6	V _{POL} : Vehicle Emissions (TONs)
7	V_{POL} . Vehicle Emissions (1013) VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
8	0.002205: Conversion Factor grams to pounds
9	EF_{POL} : Emission Factor for Pollutant (grams/mile)
10	VM: Worker Trips On Road Vehicle Mixture (%)
11	2000: Conversion Factor pounds to tons
12	F F
13	- Off-Gassing Emissions per Phase
14	$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$
15	
16	VOC _{AC} : Architectural Coating VOC Emissions (TONs)
17	BA: Area of Building (ft ²)
18	2.0: Conversion Factor total area to coated area (2.0 ft ² coated area / total area)
19	0.0116: Emission Factor (lb/ft ²)
20	2000: Conversion Factor pounds to tons
21	
22	7.5 Paving Phase
23	
24	7.5.1 Paving Phase Timeline Assumptions
25	
26	- Phase Start Date
27	Start Month: 1
28	Start Quarter: 1
29	Start Year: 2025
30	Dhase Drug tion
31 32	- Phase Duration Number of Month: 12
33	Number of Days: 0
33 34	Number of Days.
35	7.5.2 Paving Phase Assumptions
36	1.5.2 Tuving Thuse Assumptions
37	- General Paving Information
38	Paving Area (ft^2): 325699
39	
40	- Paving Default Settings
41	Default Settings Used: Yes
42	Average Day(s) worked per week: 5 (default)
43	
44	- Construction Exhaust (default)
	Equipment Name Number Of
	Equipment
	Pavers Composite 1
	Paving Equipment Composite 2
	Rollers Composite 2
45	
46	- Vehicle Exhaust
47 18	Average Hauling Truck Round Trip Commute (mile): 20 (default)
48	

49 - Vehicle Exhaust Vehicle Mixture (%)

Hours Per Day

	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 7 8

9

7.5.3 Paving Phase Emission Factor(s)

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

Graders Composite								
	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction	Equipment	t Composite	e					
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozen	s Composit	te						
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SOx	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	SOx	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

10 11

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

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	Pb	\mathbf{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

12 13

14

7.5.4 Paving Phase Formula(s)

15 - Construction Exhaust Emissions per Phase

- 16 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$
- 17

27

- 18 CEE_{POL}: Construction Exhaust Emissions (TONs)
- 19 NE: Number of Equipment
- 20 WD: Number of Total Work Days (days)
- 21 H: Hours Worked per Day (hours)
- 22 EF_{POL}: Emission Factor for Pollutant (lb/hour)
- 23 2000: Conversion Factor pounds to tons
- 2425 Vehicle Exhaust Emissions per Phase
- 26 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

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1	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
2	PA: Paving Area (ft ²)
3	0.25: Thickness of Paving Area (ft)
4	(1 / 27): Conversion Factor cubic feet to cubic yards ($1 \text{ yd}^3 / 27 \text{ ft}^3$)
5	HC: Average Hauling Truck Capacity (yd ³)
6	(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd ³)
7	HT: Average Hauling Truck Round Trip Commute (mile/trip)
8	
9	$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$
10	
11	V _{POL} : Vehicle Emissions (TONs)
12	VMT _{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)
13	0.002205: Conversion Factor grams to pounds
14	EF _{POL} : Emission Factor for Pollutant (grams/mile)
15	VM: Vehicle Exhaust On Road Vehicle Mixture (%)
16	2000: Conversion Factor pounds to tons
17	
18	- Worker Trips Emissions per Phase
19	$VMT_{WT} = WD * WT * 1.25 * NE$
20	
21	VMT _{WT} : Worker Trips Vehicle Miles Travel (miles)
22	WD: Number of Total Work Days (days)
23	WT: Average Worker Round Trip Commute (mile)
24	1.25: Conversion Factor Number of Construction Equipment to Number of Works
25	NE: Number of Construction Equipment
26	
27	$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$
28	
29	V _{POL} : Vehicle Emissions (TONs)
30	VMT _{VE} : Worker Trips Vehicle Miles Travel (miles)
31	0.002205: Conversion Factor grams to pounds
32	EF_{POL} : Emission Factor for Pollutant (grams/mile)
33	VM: Worker Trips On Road Vehicle Mixture (%)
34	2000: Conversion Factor pounds to tons
35	2000. Conversion ractor pounds to tons
36	- Off-Gassing Emissions per Phase
37	$VOC_P = (2.62 * PA) / 43560$
38	VOCP = (2.02 - 1R) / +5500
39	VOC _P : Paving VOC Emissions (TONs)
40	2.62: Emission Factor (lb/acre)
40	PA: Paving Area (ft ²)
42	43560: Conversion Factor square feet to acre (43560 ft2 / acre) ² / acre)
42	45500. Conversion Pactor square reet to acre (45500 ft2 / acre) / acre)
43 44	
45	8. Aircraft
46	
47	8.1 General Information & Timeline Assumptions
48	
49	- Add or Remove Activity from Baseline? Add
50	
51	- Activity Location
52	County: Johnson
53	Regulatory Area(s): NOT IN A REGULATORY AREA

B-208 NOVEMBER 2023

1 B-21 TGOs - Activity Title:

-	inconvity indice	D 21 100
2		
3	- Activity Descript	tion:
4	2,850 annual T	GOs
5		
6	- Activity Start Da	nte
7	Start Month:	1
8	Start Year:	2025
9		
10	- Activity End Dat	te
11	Indefinite:	Yes
12	End Month:	N/A
13	End Year:	N/A
14		
15	- Activity Emission	ns:

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.173988
SO _x	4.944107
NO _x	77.771398
СО	5.906712
PM 10	16.377207

16 17

- Activity Emissions [Test Cell part]:

incurrey Linissio	ns [rest een purt].
Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000
PM 10	0.000000

18

8.2 Aircraft & Engines 19 20

8.2.1 Aircraft & Engines Assumptions 21

22	_	_
23	- Aircraft & Engine	
24	Aircraft Designation:	B-2A
25	Engine Model:	F118-GE-100
26	Primary Function:	Transport - Bomber
27	Aircraft has After burn:	No
28	Number of Engines:	4
29		
30	- Aircraft & Engine Surrogat	e
31	Is Aircraft & Engine a Su	irrogate? No
32	Original Aircraft Name:	
22	Original Engine Name	

- **Original Engine Name:** 33 34
- 35 8.2.2 Aircraft & Engines Emission Factor(s)
- 36 37

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5	CO ₂ e
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

DRAFT | ENVIRONMENTAL IMPACT STATEMENT

B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

Pollutant	Emissions Per Year (TONs)
PM 2.5	14.753298
Pb	0.000000
NH ₃	0.000000
CO ₂ e	14943.2

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

								NOV	EMBER 2023	B-209
	After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234]
1 2 3 4	 8.3 Flight Operations 8.3.1 Flight Operations Assumptions 									
5		- F	F							
6	- Flight Opera									
7		f Aircraft:	_				1	2		
8		eration Cycle				se Pattern)	2	580		
9 10		f Annual Flig f Annual Tri			r all Alferal		0			
11	i uniber o		in rest(s) pe	i miciali.			0			
12 13	- Default Setti	ngs Used:	No							
14	- Flight Opera		Гіme In Mo	de)						
15	Taxi [Idle	- /			0					
16		[Approach]			5.45					
17 18		t [Intermedia ⁄Iilitary] (mir			4.4 0.48					
19		After Burn] (1			0.40					
20	[-](-	/ *		, , , , , , , , , , , , , , , , , , ,					
21	Per the Air Em									
22	burner for take		itary power	and 50% afte	erburner. (Ex	cception mad	le for F-35 v	where KARN	ES 3.2 flight	
23 24	profile was use	d)								
24 25	- Trim Test									
25 26	Idle (mins):	0							
27	Approach		0							
28		ate (mins):	0							
29	Military (0							
30	AfterBurr	n (mins):	0							
31 32	8.3.2 Flight	Onorations I	Formula(c)							
32 33	0.3.2 Fight	Operations I	ronnua(s)							
34	- Aircraft Emi	ssions per M	ode for Flig	ht Operation	n Cvcles per	Year				
35	$AEM_{POL} = (TI)$									
36										
37		Aircraft Emiss		lutant & Mo	de (TONs)					
38 39		e in Mode (mi ersion Factor n	,							
39 40		Flow Rate (lb/		urs						
41		version Facto		000pounds						
42		sion Factor (lb								
43		ber of Engines								
44		nber of Flight			aircraft)					
45	2000: Cor	version Facto	r pounds to 7	rons						
46 47	- Aircraft Emi	ssions for TR	aht Anarati	on Cycles n	or Voor					
48	$AE_{FOC} = AEM_{II}$					OUT + AEM	LAKEOEE			
49				AFFRUACH	CLIMI		ANLUFF			
50	AE _{FOC} : A	rcraft Emissic	ons (TONs)							
51	AEM _{IDLE_I}	N: Aircraft Er	nissions for							
52		DUT: Aircraft H				、 、				
53	AEMAPPRO	ACH: Aircraft	Emissions fo	or Approach	Mode (TON	s)				

B-210	NOVEMBER 2023
1	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
2	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
3	
4	- Aircraft Emissions per Mode for Trim per Year
5	AEPS _{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000
6	
7	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
8	TD: Test Duration (min)
9	60: Conversion Factor minutes to hours
10	FC: Fuel Flow Rate (lb/hr)
11	1000: Conversion Factor pounds to 1000pounds
12	EF: Emission Factor (lb/1000lb fuel)
13 14	NE: Number of Engines NA: Number of Aircraft
14	NTT: Number of Trim Test
16	2000: Conversion Factor pounds to TONs
10	
18	- Aircraft Emissions for Trim per Year
19	$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$
20	
21	AE _{TRIM} : Aircraft Emissions (TONs)
22	AEPS _{IDLE} : Aircraft Emissions for Idle Power Setting (TONs)
23	AEPS _{APPROACH} : Aircraft Emissions for Approach Power Setting (TONs)
24	AEPS _{INTERMEDIATE} : Aircraft Emissions for Intermediate Power Setting (TONs)
25	AEPS _{MILITARY} : Aircraft Emissions for Military Power Setting (TONs)
26 27	AEPS _{AFTERBURN} : Aircraft Emissions for After Burner Power Setting (TONs)
28	
29	9. Aircraft
30	
31	9.1 General Information & Timeline Assumptions
32	ľ
33	- Add or Remove Activity from Baseline? Remove
34	
35	- Activity Location
36	County: Johnson
37 38	Regulatory Area (s): NOT IN A REGULATORY AREA
38 39	- Activity Title: B-2A TGOs
40	- Activity Huc. D 2/11003
41	- Activity Description:
42	1,208 annual TGOs
43	
44	- Activity Start Date
45	Start Month: 1
46	Start Year: 2025
47	
48	- Activity End Date
49 50	Indefinite: Yes
50 51	End Month:N/AEnd Year:N/A
51 52	Linu ivaf; IV/A
53	- Activity Emissions:
55	Pollutant Emissions Per Year (TONs) Pollutant Emissions Per Year (TONs)

B-211

VOC	-0.081464
SO _x	-2.314915
NO _x	-36.413895
СО	-2.765623
PM 10	-7.668088

- Activity Emissions [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000
PM 10	0.000000

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine Aircraft Designation:

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

B-2A

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO _x	NO _x	СО	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 Operations25

6 9.3.1 Flight Operations Assumptions

26
27

28	- Flight Operations
29	Number of Aircraft:
30	Flight Operation Cyc

	i uniber of fill cruite		
30	Flight Operation Cycle	е Туре:	CP (Close Pattern)
31	Number of Annual Fli	ght Operation Cycles for al	l Aircraft:
32	Number of Annual Tri	im Test(s) per Aircraft:	
33			
34	- Default Settings Used:	No	
35			
36	- Flight Operations TIMs (Time In Mode)	
37	Taxi [Idle] (mins):		0

PM 2.5	-6.907746
Pb	0.000000
NH ₃	0.000000
CO ₂ e	-6996.7

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000
CO ₂ e	0.0

B-212	NOVEMBER 2023
1	Approach [Approach] (mins): 5.45
2	Climb Out [Intermediate] (mins): 4.4
3	Takeoff [Military] (mins): 0.48
4	Takeoff [After Burn] (mins): 0
5	
6	Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after
7	burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight
8	profile was used)
9	
10	- Trim Test
11 12	Idle (mins):0Approach (mins):0
12	Intermediate (mins): 0
13	Military (mins): 0
15	AfterBurn (mins): 0
16	
17	9.3.2 Flight Operations Formula(s)
18	
19	- Aircraft Emissions per Mode for Flight Operation Cycles per Year
20	$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$
21	
22 23	AEM _{POL} : Aircraft Emissions per Pollutant & Mode (TONs) TIM: Time in Mode (min)
23 24	60: Conversion Factor minutes to hours
25	FC: Fuel Flow Rate (lb/hr)
26	1000: Conversion Factor pounds to 1000pounds
27	EF: Emission Factor (lb/1000lb fuel)
28	NE: Number of Engines
29	FOC: Number of Flight Operation Cycles (for all aircraft)
30	2000: Conversion Factor pounds to TONs
31	
32	- Aircraft Emissions for Flight Operation Cycles per Year
33 34	$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$
34 35	AE _{FOC} : Aircraft Emissions (TONs)
36	AEM _{IDLE IN} : Aircraft Emissions for Idle-In Mode (TONs)
37	AEM _{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
38	AEM _{APPROACH} : Aircraft Emissions for Approach Mode (TONs)
39	AEM _{CLIMBOUT} : Aircraft Emissions for Climb-Out Mode (TONs)
40	AEM _{TAKEOFF} : Aircraft Emissions for Take-Off Mode (TONs)
41	
42	- Aircraft Emissions per Mode for Trim per Year
43 44	$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$
44 45	AEPS _{POL} : Aircraft Emissions per Pollutant & Power Setting (TONs)
45 46	TD: Test Duration (min)
47	60: Conversion Factor minutes to hours
48	FC: Fuel Flow Rate (lb/hr)
49	1000: Conversion Factor pounds to 1000pounds
50	EF: Emission Factor (lb/1000lb fuel)
51	NE: Number of Engines
52	NA: Number of Aircraft
53 54	NTT: Number of Trim Test
54 55	2000: Conversion Factor pounds to TONs
55	

1 - Aircraft Emissions for Trim per Year

2 $AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

- 3
- 4 AE_{TRIM}: Aircraft Emissions (TONs)
- 5 AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs)
- 6 AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)
- 7 AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs)
- 8 AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)
- 9 AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)
- 10

B-214 NOVEMBER 2023

Whiteman AFB Snapshot Scenario Air Conformity Applicability Model **B.4.8** 1 **Report Record Of Air Analysis (ROAA)** 2 3 1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 4 an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force 5 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 6 7 of the ACAM analysis. 8 9 a. Action Location: 10 WHITEMAN AFB **Base:** 11 Missouri State: 12 County(s): Johnson 13 NOT IN A REGULATORY AREA **Regulatory Area(s):** 14 15 b. Action Title: B 21 Beddown Main Operating Base 2 (MOB 2) or Main Operating Base 3 (MOB 3) at Dyess AFB 16 or Whiteman AFB 17 18 c. Project Number/s (if applicable): 19 20 d. Projected Action Start Date: 1 / 2025 21 22 e. Action Description: 23 24 To meet the underlying purpose and need, the Proposed Action is for the DAF to implement the beddown of the 25 B 21 MOB 2. The MOB 2 beddown would include establishing the B 21 Operations Squadrons, WIC and OT&E, 26 as well as constructing a WGF, developing new infrastructure, and increasing numbers of personnel to support 27 and conduct B-21 aircraft operations. This EIS considers two alternative locations for the MOB 2 beddown of the 28 B 21 (Dvess AFB and Whiteman AFB) and evaluates impacts where construction, training, and operational 29 activities would occur. As previously described in Section 1.1 (Introduction), if a candidate base is selected as the 30 MOB 2 location, then the remaining candidate base would subsequently become the MOB 3 beddown location. 31 Air operations and personnel numbers for the MOB 3 beddown are not anticipated to exceed those analyzed in 32 this EIS and construction activities are anticipated to the be the same for either MOB location. Therefore, the 33 analysis presented in this EIS sufficiently represents potential impacts associated with either the MOB 2 or MOB 34 3 beddown actions for either location. 35 36 The Proposed Action includes common elements that a B-21 MOB 2 would bring to, or require at, either candidate 37 base to make them operationally ready. These elements are associated with personnel, airfield operations, airspace 38 and range utilization, facilities and infrastructure, and the WGF. 39 40 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 41 42 operations and personnel over time, an approximation, or "snapshot" scenario, was developed. This snapshot 43 scenario considers the temporary timeframe when B-1 or B-2 operations and personnel would overlap with 44 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. 45 46 47 48 f. Point of Contact: 49 Name: Brad Boykin 50 Title: CTR 51 **Organization:** Leidos 52 **Email:** boykinb@leidos.com 53 **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:

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.

13

1 2 3

4 5 6

14 "Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts 15 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 16 17 threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the 18 GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in 19 areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant 20 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 21 22 or contribute to an exceedance on one or more NAAOSs. For further detail on insignificance indicators see chapter 4 23 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced 24 Assessments.

25

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

29 Analysis Summary:

30 31

28

2025				
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR		
	(ton/yr)	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			

32 33

2020 - (Sleady State)				
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR		
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	7.289	250		
NOx	165.492	250		
СО	103.782	250		
SOx	12.289	250		
PM 10	20.272	250		
PM 2.5	17.995	250		

2026 - (Stondy State)

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

B-216

1 2

3

4

5

6

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.

7 8 9 10 11 Brad Boykin, CTR 12

4/2/2023 DATE

13	B.5	REFERENCES
14		

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.

21 EPA. (2023b). NAAQS Table (National Ambient Air Quality Standards). Retrieved

- August 1, 2023, from U.S. Environmental Protection Agency:
- 23 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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1 C. LAND USE SUPPORTING INFORMATION

C.1 OFF-BASE LAND USE AND ASSOCIATED NOISE ZONES AND ACCIDENT 3 POTENTIAL ZONES

4 C.1.1 Dyess Air Force Base

5 The following is a summary of information contained in the 2015 Dyess Air Force Base 6 (AFB) Air Installations Compatible Use Zones (AICUZ) study (Dyess AFB, 2015). Off-base 7 land use categories are discussed in the context of definitions provided in that study. Note 8 that land use categories have since been updated, and the revised definitions are used 9 for descriptions and analyses associated with the No Action Alternative and Proposed 10 Action.

Land use in most areas adjacent to Dyess AFB consists primarily of open space/low 11 density, with a small amount of residential, commercial, and industrial. A mix of 12 13 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 14 Comprehensive Plan (City of Abilene, 2004). The city recognizes Dyess AFB as a 15 significant asset to the local economy and is committed to promoting policies that will 16 enable the base to meet current and future mission requirements. The city's land use 17 and development strategies include controlling incompatible encroachment around the 18 Abilene airport zoning regulations mitigate effects to the public from airfield 19 base. operations at Dyess AFB. 20

Approximately 77 percent of land within the Tye city limit consists of open space/low-density 21 use (Dyess AFB, 2015). The city center has an interspersed land use pattern of 22 residential, recreational, and public/guasi-public. Commercial and industrial land use 23 occurs adjacent to I-20. A mixture of mostly residential and industrial land uses occurs 24 along other primary roads. The city of Tye recognizes the noise zones and Accident 25 Potential Zones (APZs) of Dyess AFB as a growth development restraint. In the 26 community of Caps, industrial land use occurs along Highway 277. Land use in the 27 remainder of the community consists primarily of open space/low density, along with small 28 amounts of residential. Taylor County does not have land use regulations. Outside of 29 Abilene, Tye, and Caps, the great majority of county land use in the vicinity of Dyess AFB 30 is open space/low density, along with a small number of residential parcels. 31

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	+08	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.

1 2

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			
Land Use Category	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 3 consists of open space/low density, which is compatible with all noise levels. Open 4 space/low density accounts for about 87 percent of land use within the combined 5 CZs/APZs. The base's AICUZ and Installation Complex Encroachment Management 6 Action Plan (ICEMAP) studies provide additional information on specific areas within noise 7 zones and APZs under existing conditions. Land use in noise zones within the Abilene city 8 9 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 10 extraterritorial jurisdiction (regulated areas outside the city limits) (Dyess AFB, 2018). Five 11 residential areas in the city of Tye occur within noise zones greater than 65 A-weighted 12 decibels (dBA) day-night average sound level (DNL). Two of these areas, along with the 13 Tye RV Park, are considered incompatible. Public/guasi-public land use areas occur in the 14 center of Tye within noise zones of 75+ dBA DNL, which is also considered incompatible. 15 Overall, most land within the 75+ dBA DNL noise zones are open space/low-density, 16 commercial, and agricultural use. In the community of Caps, conditionally compatible land 17 in the 80+ dBA DNL noise zone consists of industrial use. Incompatible use consists of 18

C-3

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, 3 with the exception of Air Base Road, which traverses the northeastern corner of the CZ. 4 Land in the northern APZ I consists primarily of open space/low-density use but also 5 contains residential, commercial, and public/guasi-public use. Residential land use is 6 considered incompatible, while commercial and public/quasi-public uses are considered 7 conditionally compatible. Land in the northern APZ II also consists primarily of open space/ 8 9 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 10 existing large industrial and commercial parcels, along with some small residential lots, to 11 vacant/agricultural use. This would alleviate some of the compatibility issues associated 12 with the APZs. Approximately half of the land in the southern CZ is within the installation 13 boundaries; the remaining land consists of open space/low density, including some 14 agricultural use. There is an industrial use in southern APZ I. Dyess AFB owns restrictive 15 easements to prevent development within this area, and because of these easements, it is 16 considered a compatible use. Without the easements, this area would be conditionally 17 compatible. All land in the southern APZ I and the majority of land in APZ II consists of 18 open space/low density, which is considered compatible. Residential and industrial land in 19 20 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 21 small portion of land for the Runway 163/343 Landing Zone extends outside the installation; 22 land use in this area is open space/low density, which is compatible. Dyess AFB has 23 proposed the designation of a Safety Influence Area within the CZs and APZs, which would 24 prevent further development of incompatible and not-recommended land uses in these 25 areas (Dyess AFB, 2018). 26

27 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, 33 commercial, and industrial development exists around local communities and along major 34 transportation routes (Whiteman AFB, 2015). The 3,500-acre Knob Noster State Park, 35 which provides recreation areas and open spaces, borders the installation to the west. 36 Zoning ordinances are established within incorporated city limits (e.g., Knob Noster, 37 Warrensburg, and Sedalia), but there is generally no zoning or planning regulations for 38 unincorporated areas of Johnson County (Johnson County EDC, 2021). Most of the 39 unincorporated land of Johnson and Pettis Counties near Whiteman AFB is 40 rural/agricultural production. Residential activity in unincorporated areas consists mostly 41

C-4 NOVEMBER 2023

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 3 commercial, public, agricultural, and industrial use (Whiteman AFB, 2015). Knob Noster 4 zoning regulations identify an Airport Overlay District, which is designed to protect people 5 living near Whiteman AFB and to preserve the base's operational stability. A stated 6 objective of the regulations is to facilitate implementation of AICUZ recommendations. The 7 regulations establish land use controls for new and expanded construction, especially 8 9 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 10 restrictions recommended in the AICUZ study. Noise reduction techniques are 11 implemented in some new structures near the installation. The cities of Warrensburg and 12 Sedalia do not have land use controls related to Whiteman AFB specifically (Whiteman 13 AFB, 2014). 14

Johnson County has established a Whiteman Air Force Base Planning and Zoning area. 15 which is administered by the Johnson County Military Airport Zoning Commission. The 16 commission was formed to protect residences and businesses around Whiteman AFB from 17 flight hazards and to limit encroachment in unincorporated areas. The commission 18 coordinates with the Missouri Military Preparedness and Enhancement Commission and 19 the Whiteman Area Base Coordinating Council on issues related to development and 20 encroachment (Pioneer Trails Regional Planning Commission, 2021). One of the 21 commission's stated objectives is to implement land use planning and development 22 23 management to help maintain the operational function of Whiteman AFB. The Military Airport Comprehensive Plan for the Unincorporated Areas of Johnson County includes 24 goals to create compatible land uses, reduce encroachment, and provide for public safety 25 near Whiteman AFB (Whiteman AFB, 2011). The county has implemented a Military 26 Airport Zone (MAZ) around the installation to decrease the potential for encroachment by 27 limiting housing density and regulating land use, as required under Missouri Revised 28 29 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. 30 encroachment near the base has been limited (Pioneer Trails Regional Planning 31 Commission, 2021). 32

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.

- 40 The off-base area exposed to noise levels above 65 dBA DNL and to accident zones under
- 41 existing conditions for each land use type, as defined in the 2008 Joint Land Use Study, is
- 42 shown in Table C-3. The study did not distinguish between specific noise levels or between
- 43 APZ I and APZ II.

1 2

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

identified in the 2000 Whiteman Ar B 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 3 greater consists of agriculture. This use category is compatible with all noise levels 4 evaluated, from 65 dBA to over 80 dBA DNL. About 10 percent of the land use is 5 categorized as single family residential. The base's AICUZ study recommends that 6 residential land use should be in areas with noise levels below 65 dBA DNL when possible 7 and should not be in areas with noise levels above 75 dBA DNL. The total land area 8 9 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 10 41 percent of the CZ land area is located outside the base boundary and is subject to 11 restrictive easements (Whiteman AFB, 2015). 12

The base's ICEMAP provides information on specific areas within off-base noise zones 13 and APZs under existing conditions. Numerous parcels located north and south of the 14 Whiteman AFB runway, and which are fully or partially outside the 3,000-foot MAZ, are 15 subject to noise levels from 65 to over 70 dBA DNL. A total of 1.316 acres outside the 16 MAZ are within the 65 to 69 dBA DNL noise contour, and 120 acres are within the 70 to 17 74 dBA DNL contour. Land use regulations contained in the MAZ Ordinance do not apply 18 to these unregulated parcels. In addition, noise attenuation measures are not required in 19 unregulated areas of Johnson County. Land use that does not conform to current zoning 20 regulations is present within accident zones. Approximately 86 acres of residential 21 development is located north of the installation within APZ I. The total consists of a 25-22 acre mobile home development in Knob Noster and 61 acres of single-family residential 23 development in unincorporated Johnson County. The City of Knob Noster identifies future 24 land use in the mobile home parcel as industrial/business park, and the MAZ 25 26 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 27 standards only if a landowner changes the current land use. The Whiteman AFB ICEMAP 28 recommends that the installation coordinate with the City of Knob Noster, Johnson 29 County, and the MAZ Commission to identify strategies such as attaining easements on 30

- parcels within APZ I, utilizing a transfer of development rights or purchase of development 1
- rights program, or considering land acquisition. 2

C.2 LAND USE CATEGORY DEFINITIONS 3

Land Use Definitions from Dyess AFB and Whiteman AFB AICUZ Studies Table C-4.

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

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

C-6

C-7

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 she 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.					

Table C-5. Land Use Definitions Associated with the 2016 USDA Land Use Dataset Land Use Category Definition

Source: (MRLC, 2016)

1

Key: % = percent; USDA = U.S. Department of Agriculture

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

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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)				
Land Use Category	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	С	Y	Y	Y	С	С	Ν		
Developed, Low Intensity	N	N	С	С	С	Ν	Ν		
Developed, Medium Intensity	N	N	С	С	С	N	Ν		
Developed, High Intensity	N	С	С	Y	С	С	Ν		
Developed, Mobile Home	Ν	N	N	Ν	Ν	N	Ν		
Parks or Courts									
Barren Land	Y	Y	Y	Y	Y	Y	Y		
Deciduous Forest	C	С	Y	Y	С	С	С		
Evergreen Forest	С	С	Y	Y	С	С	С		
Mixed Forest	С	С	Y	Y	С	С	С		
Dwarf Scrub	С	Y	Y	Y	Y	Y	Y		
Shrub/Scrub	С	Y	Y	Y	С	С	С		
Grassland/Herbaceous	С	Y	Y	Y	С	С	С		
Sedge/Herbaceous	С	Y	Y	Y	Y	Y	Y		
Lichens	С	Y	Y	Y	Y	Y	Y		
Moss	С	Y	Y	Y	Y	Y	Y		
Pasture/Hay	С	Y	Y	Y	Y	Y	Y		
Cultivated Crops	С	Y	Y	Y	Y	Y	Y		
Woody Wetlands	С	Y	Y	Y	Y	Y	Y		
Emergent Herbaceous Wetlands	С	Y	Y	Y	Y	Y	Y		

Table C-7. Generalized Land Use Compatibility

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

1 2	C.4 REFERENCES
3	City of Abilene. (2004). Comprehensive Plan.
4	Dyess AFB. (2015). Air Installation Compatible Use Zone Study. Dyess Air Force Base.
5	Dyess AFB. (2018). Dyess Air Force Base Joint Land Use Study.
6 7 8	Johnson County EDC. (2021). <i>Licensing Permits/Zoning</i> . Retrieved December 26, 2021, from Johnson County Economic Development Corporation: https://growjocomo.com/start-locate-grow/licensing-permits-licenses/. June 7.
9 10 11 12	MRLC. (2016). National Land Cover Database 2016 (NLCD2016) Legend. Retrieved from Multi-Resolution Land Characteristics (MRLC) Consortium: https://www.mrlc.gov/data/legends/national-land-cover-database-2016-nlcd2016- legend.
13 14 15 16	Pioneer Trails Regional Planning Commission. (2021). <i>Military Airport Zoning Commission</i> . Retrieved from Pioneer Trails Regional Planning Commission: https://www.trailsrpc.org/other-services/military-airport-zoning-commission/. December 26.
17 18	Whiteman AFB. (2008). Whiteman Air Force Base Joint Land Use Study. Whiteman Air Force Base.
19 20	Whiteman AFB. (2011). Land Acquisition at Whiteman Air Force Base, Missouri. Whiteman Air Force Base.
21 22 23	Whiteman AFB. (2014). Whiteman Air Force Base & Cannon Range Installation Complex Encroachment Management Action Plan, Volume 2. Whiteman Air Force Base.
24 25	Whiteman AFB. (2015). <i>Air Installation Compatible Use Zone (AICUZ) Study.</i> WHiteman Air Force Base.



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APPENDIX D

BIOLOGICAL RESOURCES

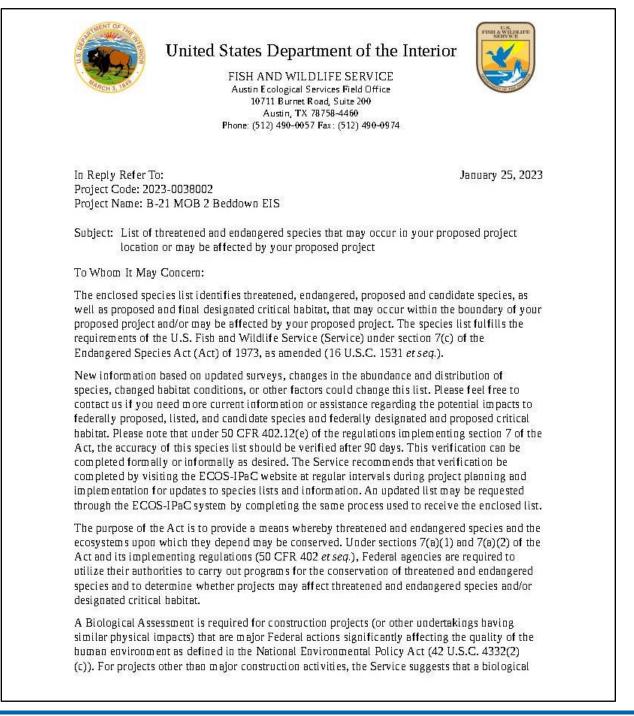
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1 D. BIOLOGICAL RESOURCES SUPPORTING INFORMATION

2 D.1 LIST OF THREATENED AND ENDANGERED SPECIES THAT MAY OCCUR IN 3 PROPOSED PROJECT LOCATION AND/OR MAY BE AFFECTED

4 D.1.1 Dyess Air Force Base

5 D.1.1.1 U.S. Fish and Wildlife List of Threatened and Endangered Species



01/25/2023

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

3

01/25/2023

Attachment(s):

1

Official Species List

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

01/25/2023

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

2

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01/25/2023

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: <u>https://www.google.com/maps/@32.4209313,-99.83774491044042,14z</u>



Counties: Taylor County, Texas

01/25/2023

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.

3

STATUS

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, 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. <u>NOAA Fisheries</u>, 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

Piping Plover Charadrius melodus	Threatened
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	
Red Knot Calidris canutus rufa	Threatened
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	

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Fishes NAME	STATUS
 Sharpnose Shiner Notropis oxyrhynchus 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 habitat; commercial/industrial well field projects. Species profile: <u>https://ecos.fws.gov/ecp/species/6492</u> 	Endangered
 Smalleye Shiner Notropis buccula 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 habitat; commercial/industrial well field projects. Species profile: https://ecos.fws.gov/ecp/species/1774 	Endangered
Insects NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/9743</u>	Candidate
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species.	Candidate
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/9743</u> Critical habitats THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OF.	Candidate

01/25/2023

IPaC User Contact Information

5

Agency:Air ForceName:Sarah Bresnan RauchAddress:13397 Lakefront Drive, Suite 100City:Earth CityState:MOZip:63045Emailsarah.e.bresnan@leidos.comPhone:3144439111

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
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Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	Description
Amphibians	Anaxyrus woodhousii	Woodhouse's toad			Ν	G5	SU		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		т	Ν	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	РТ		Ν	G3	S2		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			Ν	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.

Taxon	Species Name	Common Name	ESA	SPROT	Endemic	Global Rank	State Rank	SGCN	•
Birds	Leucophaeus pipixcan	Franklin's gull			Ν	G5	S2N	V V	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			И	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			Ν	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		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			Ν	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	Ý	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			Ν	G4G5	S4	Y	Colonial and cave dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned cliff swallow (<i>Hirundo pyrrhonota</i>) 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			Ν	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			Ν	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 Iudovicianus	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			Ν	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			Ν	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			Ν	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			Ν	G5	S2S3	Ý	Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains and riparian zones.
Mammals	Antilocapra americana	pronghorn			Ν	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			Ν	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			Ζ	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 <i>Juniperus ashei</i> 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			Ν	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	TOPROTIERA CONT	Cory's evening- primrose			Ν	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			Ν	G3G4	S 3	Y	Open sandy areas; annual; flowering March-June.
Reptiles	Crotalus horridus	timber (canebrake) rattlesnake			Ν	G4	S4		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	Ŷ	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			Ν	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			Ν	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			Ν	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			Ν	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

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

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.

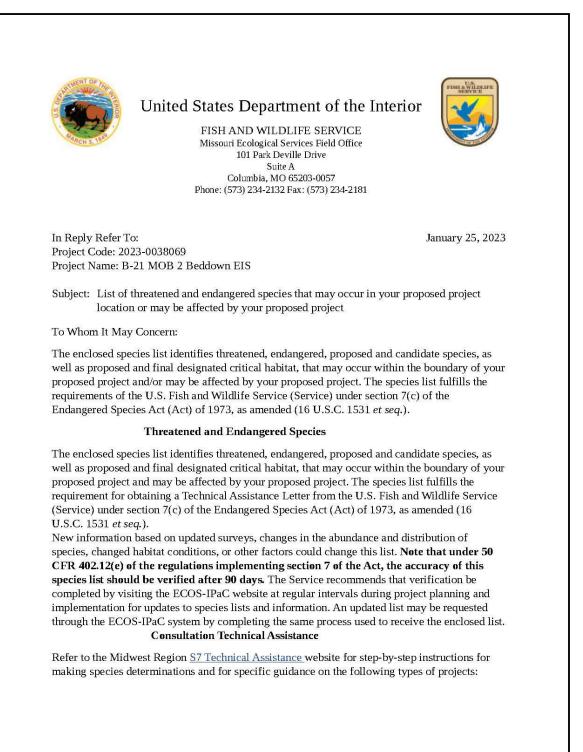
SNR-Unranked — Nation or state/province conservation status not yet assessed.

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

1 D.1.2 Whiteman Air Force Base

2 D.1.2.1 U.S. Fish and Wildlife List of Threatened and Endangered Species



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 <u>unsuitable</u> 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 <u>"No Effect" document</u> 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 <u>suitable</u> 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 <u>Range-wide Indiana Bat Summer Survey</u> <u>Guidelines</u>.

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

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 <u>guidelines</u> 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 <u>Wind Energy Guidelines</u>. In addition, please refer to the Service's <u>Eagle</u> <u>Conservation Plan Guidance</u>, 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

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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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01/25/2023 2 **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: <u>https://</u> www.google.com/maps/@38.727353699999995,-93.56137278293812,14z Knob Noster 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 Fisheries¹, 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. <u>NOAA Fisheries</u>, 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

1

	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/6329</u>	Endangered
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <u>https://ecos.fws.gov/ecp/species/5949</u> General project design guidelines: <u>https://ipac.ecosphere.fws.gov/project/SAHV6UYWX5CSLKWSEOI2FPRR6E/documents</u> <u>generated/6868.pdf</u>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/9045</u> General project design guidelines: <u>https://ipac.ecosphere.fws.gov/project/SAHV6UYWX5CSLKWSEOI2FPRR6E/documents</u> <u>generated/6868.pdf</u>	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/10515</u>	Proposed Endangered

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Insects	
NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species.	Candidate
Species profile: https://ecos.fws.gov/ecp/species/9743	
Critical habitats	
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UN JURISDICTION.	NDER THIS OFFICE'S
JURISDICTION.	

NOVEMBER 2023 D-25

01/25/2023

IPaC User Contact Information

Agency:Air ForceName:Sarah Bresnan RauchAddress:13397 Lakefront Drive, Suite 100City:Earth CityState:MOZip:63045Emailsarah.e.bresnan@leidos.comPhone:3144439111

Two Report: State Listed Endangered Species and/or Missouri 2 **Species/Natural Communities of Conservation Concern** 3 **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

Missouri Department of Conservation – Natural Heritage Review Level

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NOVEMBER 2023

D.1.2.2

Missouri Department of Conservation

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.

<u>This Natural Heritage ReviewReport is not a site clearance letter for the project.</u> 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. Mist [PaC: 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.

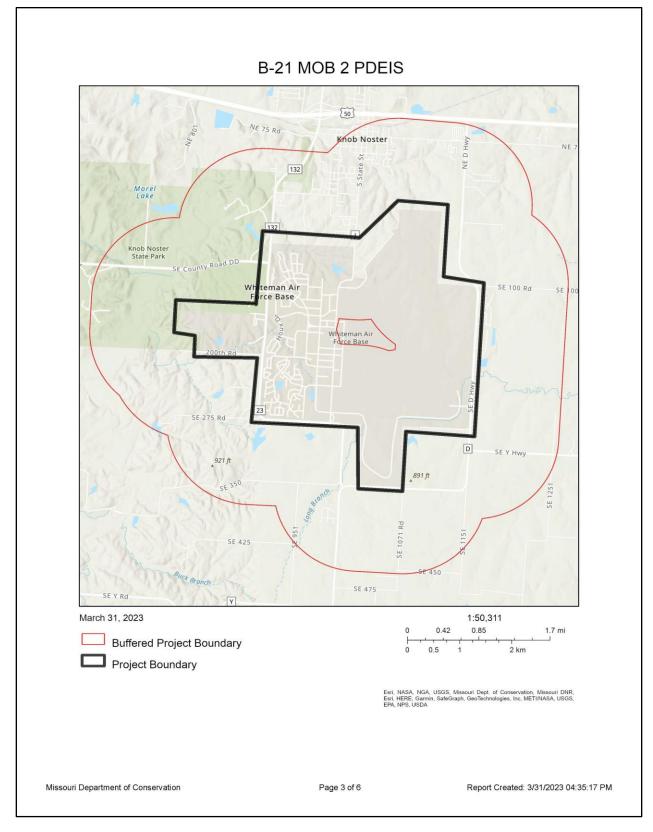
Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit <u>Home Page | Missouri Department of Transportation (modot.org)</u> for additional information on recommendations.

Missouri Department of Conservation

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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. <u>Please contact the Missouri Department of Conservation for further coordination</u>.

Em ail (preferred): <u>NaturalHeritageReview@mdc.mo.gov</u> 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, Whitem an 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 serice a 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 <u>Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).</u>

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 E cological 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.

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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 ground water in the project area. Additional information and specific recommendations are available at <u>Management</u> <u>Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov)</u>.

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 dean equipment thoroughly before moving between project sites. See <u>Managing Invasive Species in Your Community | Missouri Department of Conservation (mo.gov)</u> 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. Arm y Corps of Engineers (USACE) Clean Water Act Section 404 permit (<u>Kansas City District</u> <u>Requilatory Branch (army.mill</u>) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification I 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, waster water treatment facilities, and confined animal feeding operations. Visit <u>Wastewater Permits I Missouri</u> <u>Department of Natural Resources (mo.gov)</u> 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:

Em ail (preferred): <u>NaturalHeritageReview@mdc.mo.gov</u> MDC Natural Heritage Review Science Branch P.O. Box 180 Jefferson City, MO 651 02-0180 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 (R SMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0.4.111. 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 <u>Missouri Species and Communities of Conservation Concern Checklist (mo.gov)</u> for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at <u>Mofwis Search Results</u>. 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 1 D.2.1 **Dyess Air Force Base** 2 D.2.1.1 USFWS, Austin Ecological Services Field Office (Texas) 3 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 Austin TX 78758 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

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- 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 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

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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.

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 [Ldnmr]) or would decrease by 15 dBA Ldnmr, 3.9 dBA Ldnmr, 3.4 dBA Ldnmr, and 0.5 dBA Ldnmr 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

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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 <u>david.laurence@us.af.mil</u> 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
- 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.
- Dyess AFB. (2022). Integrated Natural Resources Management Plan (2022-2077). Abilene, Texas: Dyess Air Force Base, 7 CES/CEIE.
- Laurence, D. (2023, January 25). Personal communication between David E. Laurence, P.G. (Environmental Section Chief, Dyess AFB) and Sarah Rauch (Biologist, Leidos). RE: Observations of Special Status Species at Dyess AFB. January 25.
- NatureServe. (2022). Texas Fatmucket Lampsilis bracteata. Retrieved from NatureServeExplorer: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.1148359/Lampsilis_brac teata
- 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%20fou nd%20in,recent%20record%20from%20Lubbock%20County.&text=Like%20other%20c ave%2Ddwelling%20species,killed%20in%20its%20hibernation%20caves.

- TPWD. (n.d.). *Piping Plover (Charadrius melodus)*. Retrieved from Texas Parks and Wildlife: https://tpwd.texas.gov/huntwild/wild/species/piplover/
- USFWS. (2005). *Red Knot Calidris canutus rufa Fact Sheet*. Retrieved from U.S. Fish and Wildlife Service: https://www.fws.gov/migratorybirds/pdf/education/educational-activities/Redknotfactsheet.pdf

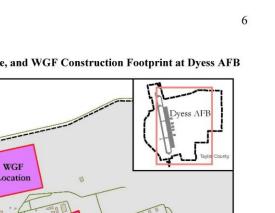
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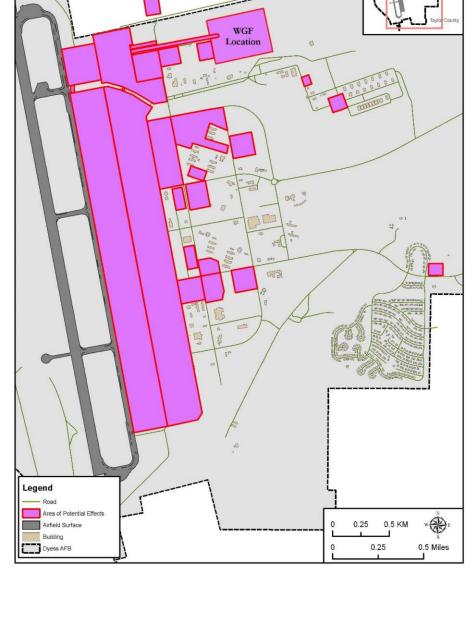
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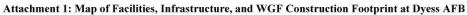
USFWS. (2023b). Information for Planning and Consultation: IPaC Resource Lists (for counties under the airspace). Retrieved from U.S. Fish and Wildlife Service: https://www.fws.gov/ipac/.

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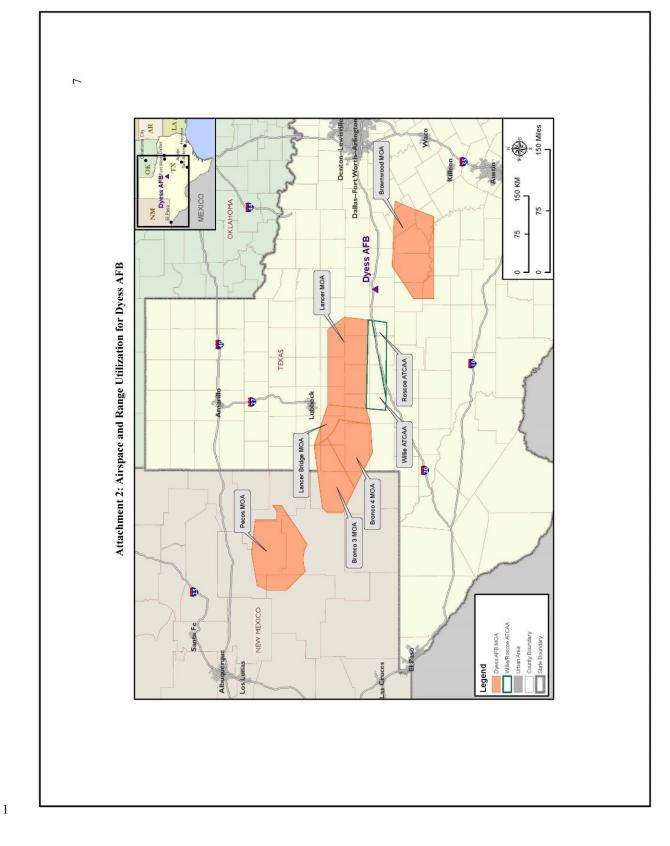
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Attachment 3. Federally Listed Species with the Potential to Occur at Dyess AFB

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

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

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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.

NOVEMBER 2023

1 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:

- 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

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- 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 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

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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.

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

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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 <u>david.laurence@us.af.mil</u> 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
- Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Dyess AFB

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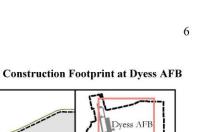
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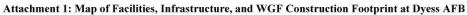
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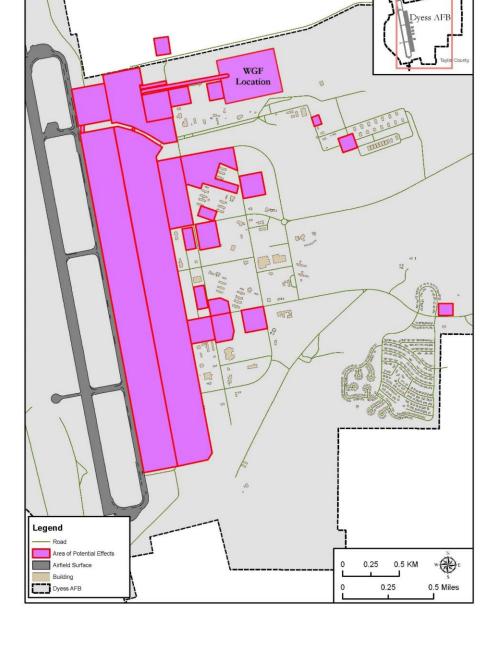
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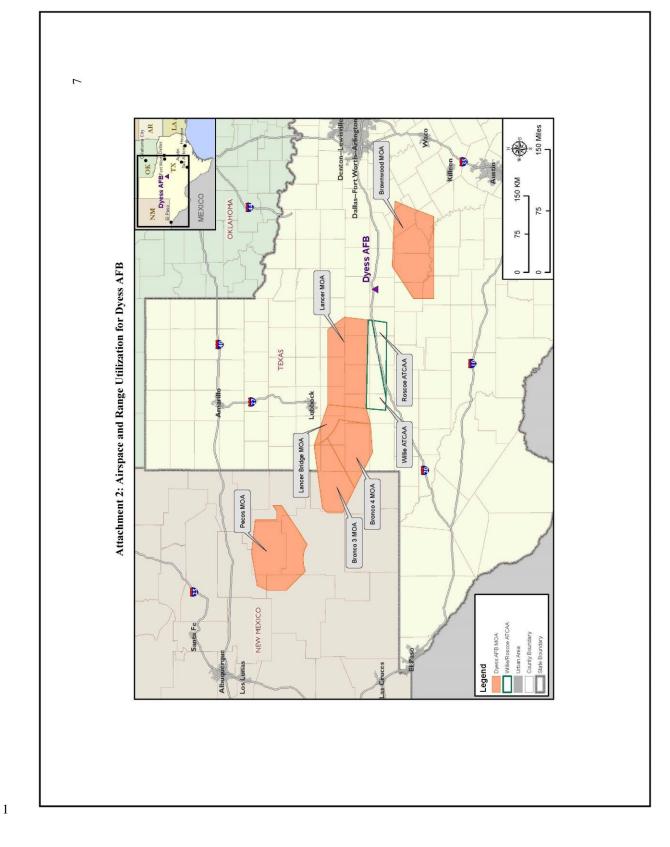
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Attachment 3: Federally Listed Species with the Potential to Occur at Dyess AFB

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

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.

nt 4: Federally Listed Species Known to Occur or With Potential to Occur Under th

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Attachmen	t 4: Federally	Known to Occur o pace for Dyess AF		tial to Occur Under the
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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. Ir 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 Countie 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-51

D-52 NOVEMBER 2023

Whiteman Air Force Base **D.2.2** 1 D.2.2.1 USFWS, Missouri Ecological Services Field Office 2 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: o The North WGF Site o 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

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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 tricolored) 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.

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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

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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 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

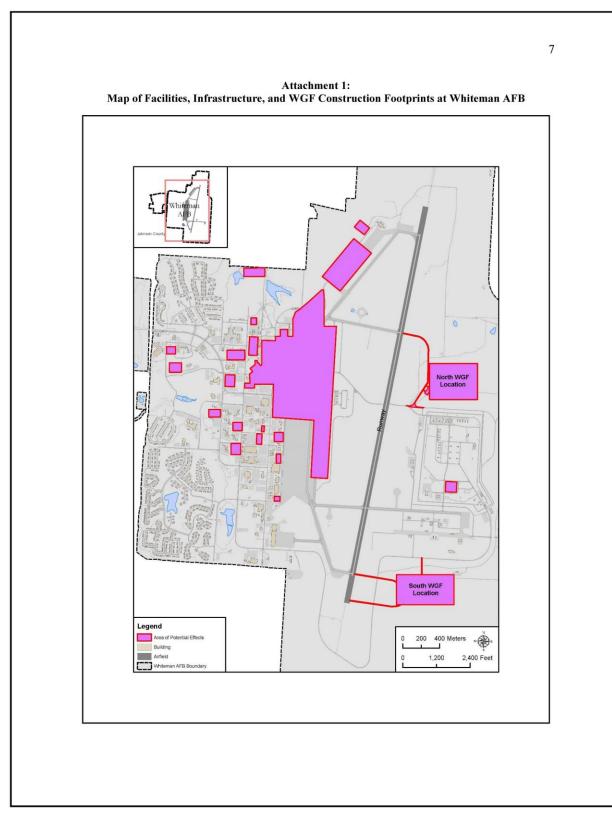
Keith Donaldson, 509 CES/CEIEC, DAF Biological Scientist

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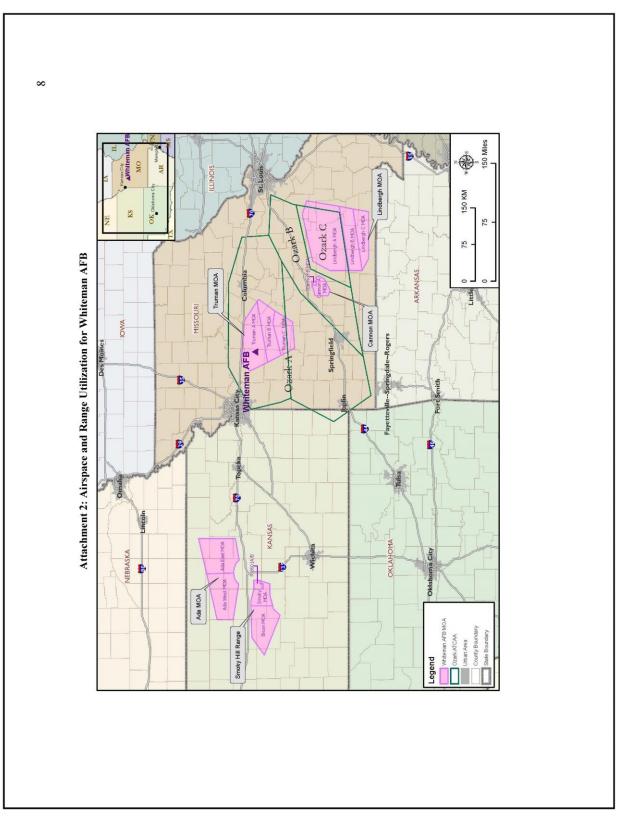
- 1. Map of Facilities, Infrastructure, and WGF Construction Footprints at Whiteman AFB
- 2. Airspace and Range Utilization for Whiteman AFB
- 3. Federally Listed Species with the Potential to Occur at Whiteman AFB
- 4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace 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.
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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/
- Whiteman AFB. (2018). Forest Health Inventory and Management Recommendation Plan. Whiteman AFB.
- Whiteman AFB. (2022). 509 BW BASH Plan 91-15. Whiteman Air Force Base.
- Whiteman AFB. (2022). Integrated Natural Resources Management Plan. Johnson County, Missouri: Whiteman Air Force Base.



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D-59

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
Tricolored Bat	Perimyotis subflavus	Proposed Endangered	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).
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.

Attachment 3: Federally Listed Species with the Potential to Occur at Whiteman AFB

Sources: Sources: (USFWS, 2023) (Whiteman AFB, 2022) Key: % = percent; AFB = Air Force Base; ROI = region of influence

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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.
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
Gray Bat	Myotis grisescens	Endangered	Cannon, Lindbergh, Ozark Truman	None	arcas.
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.

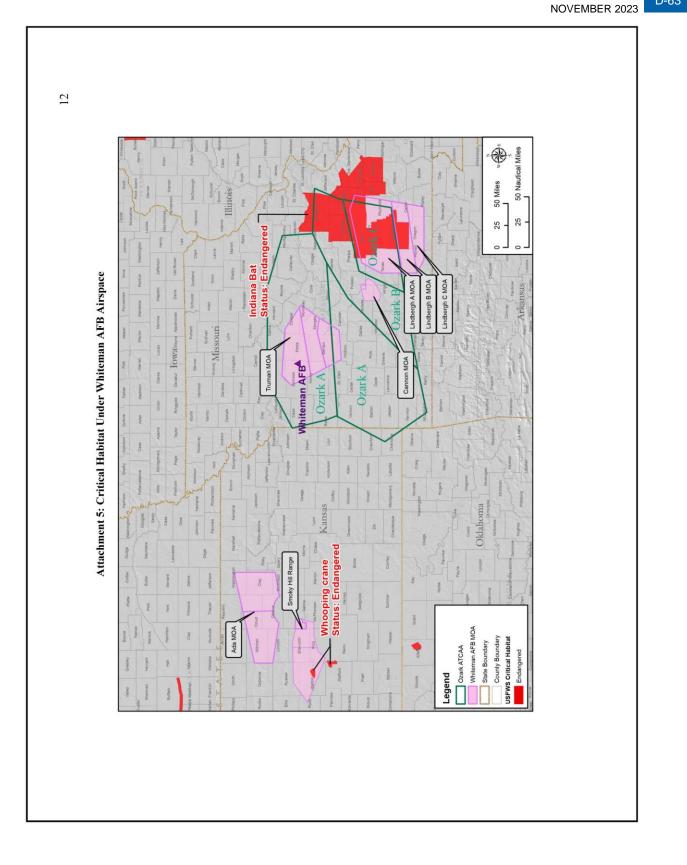
NOVEMBER 2023 D-61

	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	USFWS Designated Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Co Ozark Big- Eared Bat tou ing	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 <i>Perimyotis</i> Bat <i>subflavus</i>	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.

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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D-62



NOVEMBER 2023

1 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

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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 tricolored) 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.

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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

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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

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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

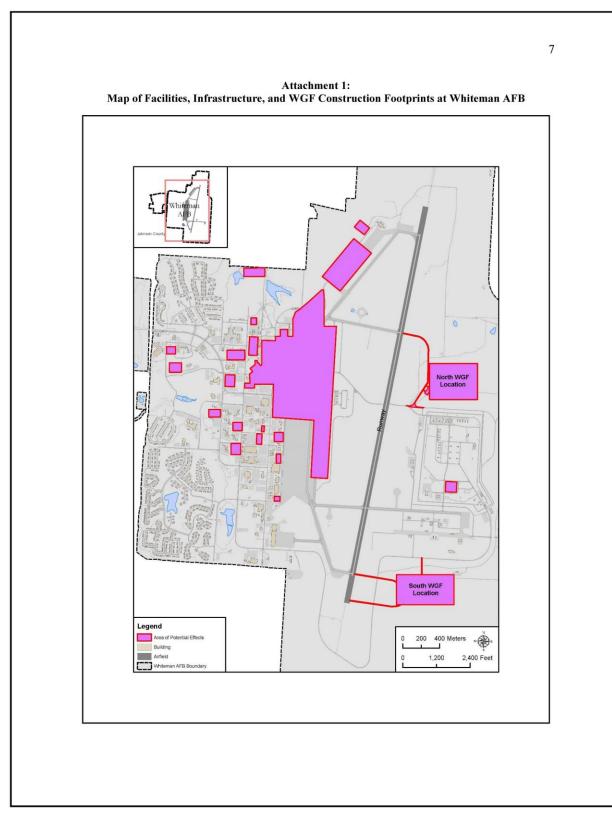
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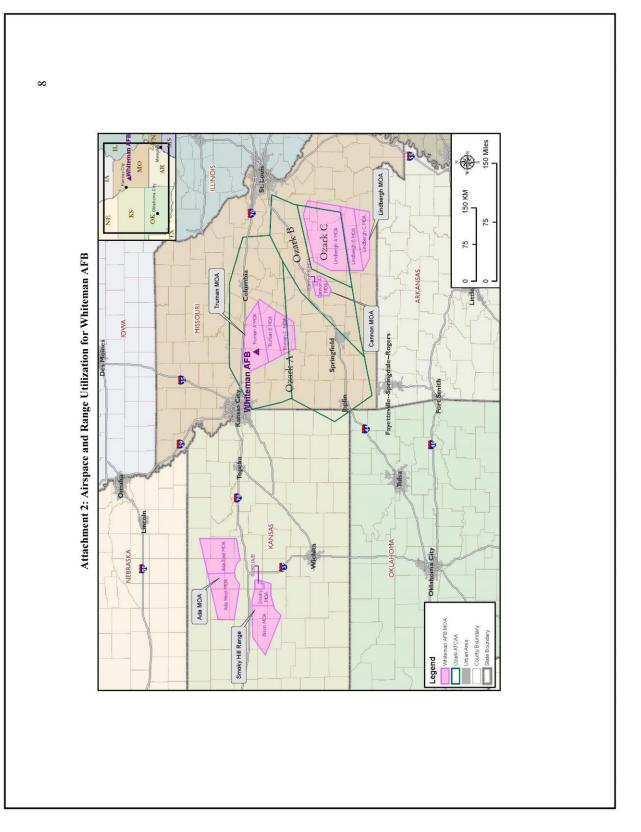
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- 3. Federally Listed Species with the Potential to Occur at Whiteman AFB
- 4. Federally Listed Species Known to Occur or With Potential to Occur Under the Airspace for Whiteman AFB
- 5. Federally Designated Critical Habitat Under Whiteman AFB Airspace

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.
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D-71

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
Tricolored Bat	Perimyotis subflavus	Proposed Endangered	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).
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	e	8 0	
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.

Attachment 3: Federally Listed Species with the Potential to Occur at Whiteman AFB

Sources: Sources: (USFWS, 2023) (Whiteman AFB, 2022) Key: % = percent; AFB = Air Force Base; ROI = region of influence

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Common Name	Scientific Name	Protection Status	Airspace Unit (MOA/ATCAA)	Critical Habitat Under the Airspace?	Potential for Occurrence Under the Airspace
Birds					
Whooping	Grus	Endangered	Ada	Smoky Hill Range	Yes. Whooping cranes are regular spring and fall
Crane	americana		Cannon Ozark Smoky Hill Range		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 erounds on the Gulf coast.
Mammals					
			Cannon,	Lindbergh	Yes. Known occurrences in the ROI. Missouri's
Indiana Bat	Myotis sodalis	Endangered	Lindbergh, Ozark Truman	Ozark	numerous cave systems and sinkholes, provide year-round roosting locations for bat populations. In Kansas, bats utilize wooded or semi-wooded
Gray Bat	Myotis grisescens	Endangered	Cannon, Lindbergh, Ozark Truman	None	areas.
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.

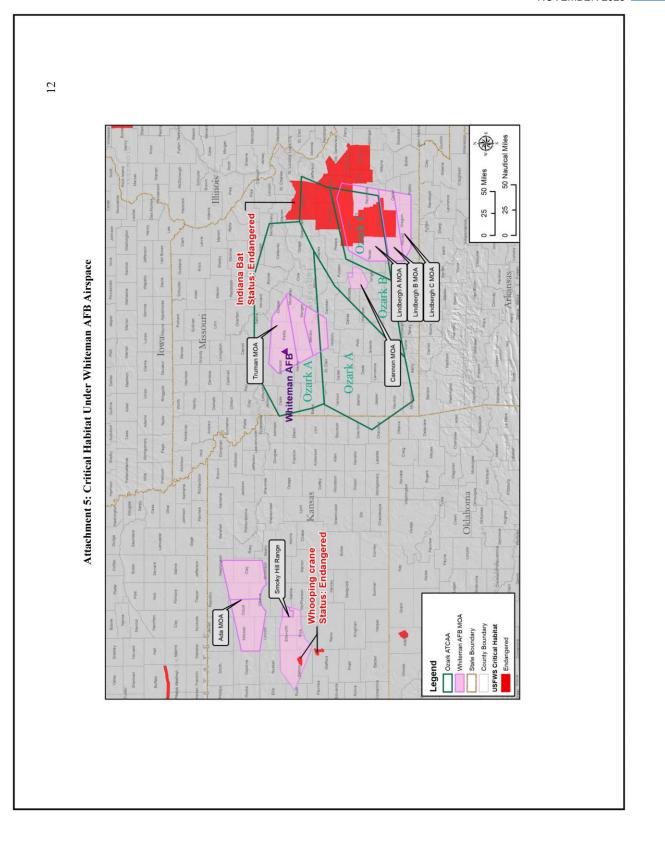
NOVEMBER 2023 D-73

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	Tri-Colored Perimyotis Bat 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.

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.

11

DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB



NOVEMBER 2023 D-75

D-76	NOVEMBER 2023
1	D.3 REFERENCES
2 3	TPWD. (2023). Rare, Threatened, and Endangered Species of Texas. Retrieved from
4	Species for Taylor County: https://tpwd.texas.gov/gis/rtest/.

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APPENDIX E

CULTURAL RESOURCES

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1 E. CULTURAL RESOURCES SUPPORTING INFORMATION

2 E.1 NATIVE AMERICAN CONSULTATION

3 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.

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. 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)

Table 1.	Facilities and	Infrastructure	for the Dyess	AFB Alternative

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.

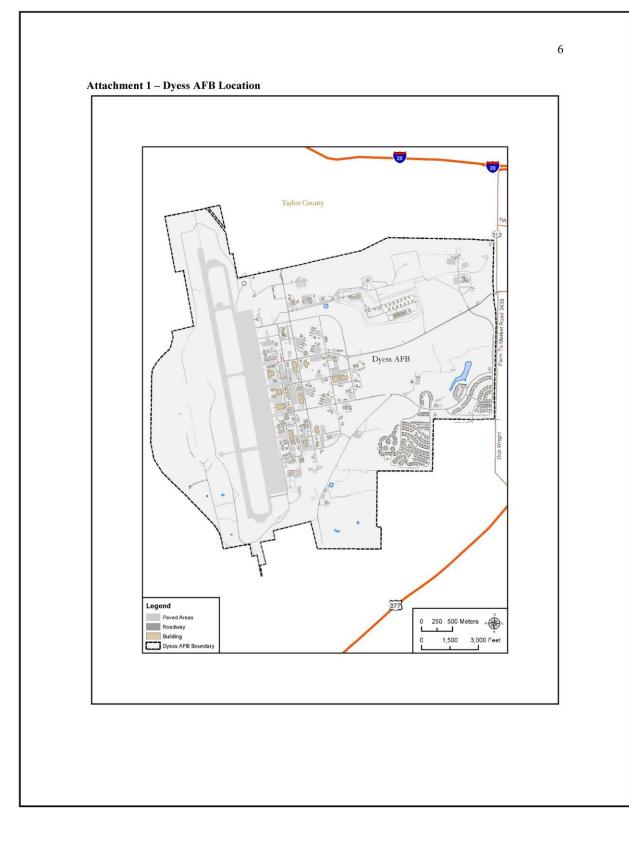
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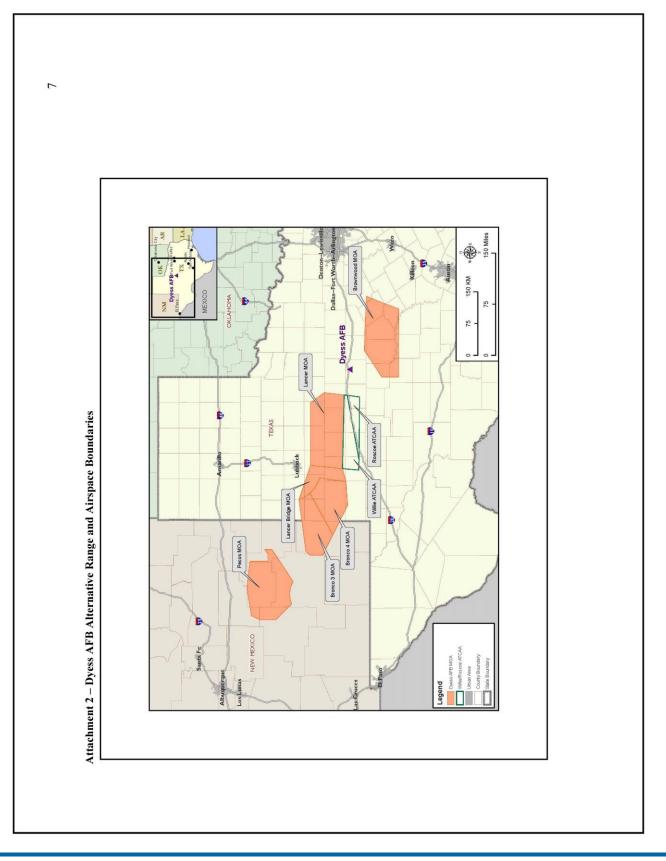
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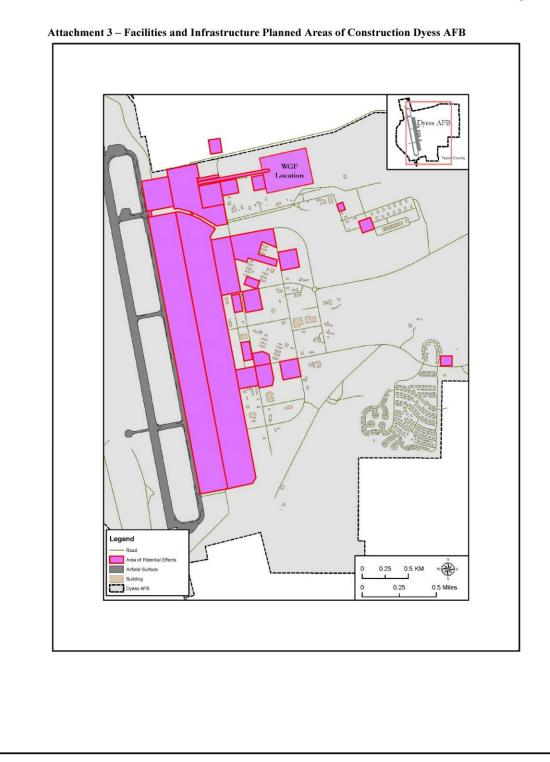
If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you. Sincerely Len JOSEPH K. KRAMER, Colonel, 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	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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Nam	e/Title of designated contact for this proposed project:
Phor	ne:
E-ma	ail:
Sign	ature:
Date	«

NOVEMBER 2023









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.

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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 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.

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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.

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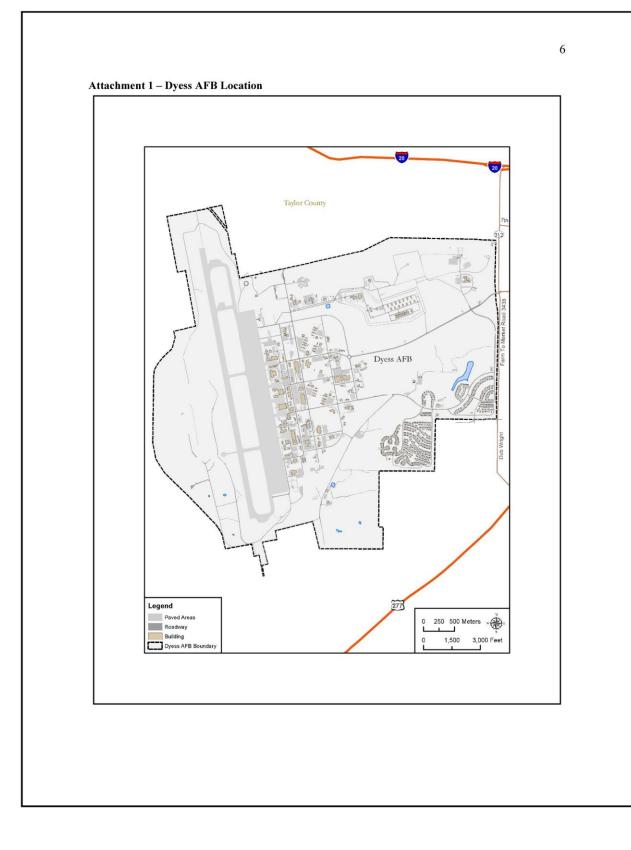
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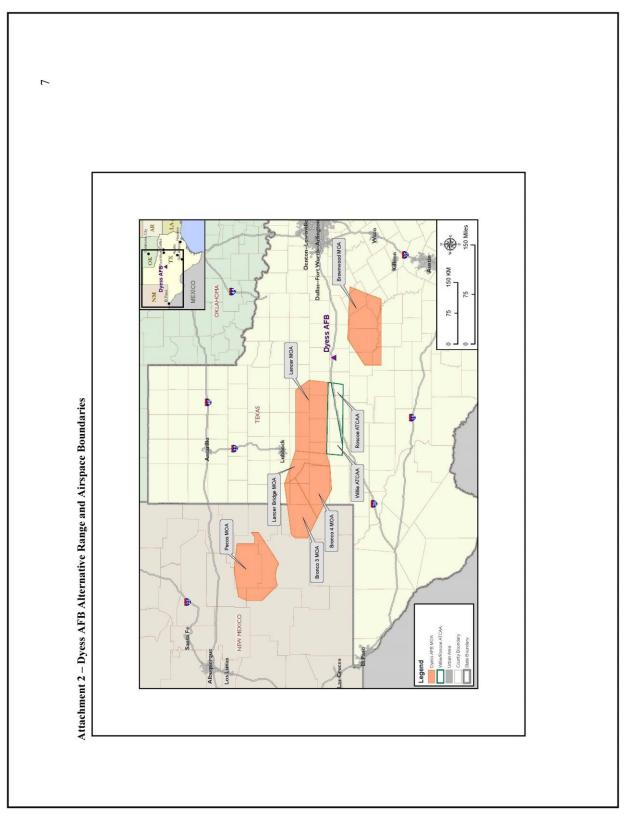
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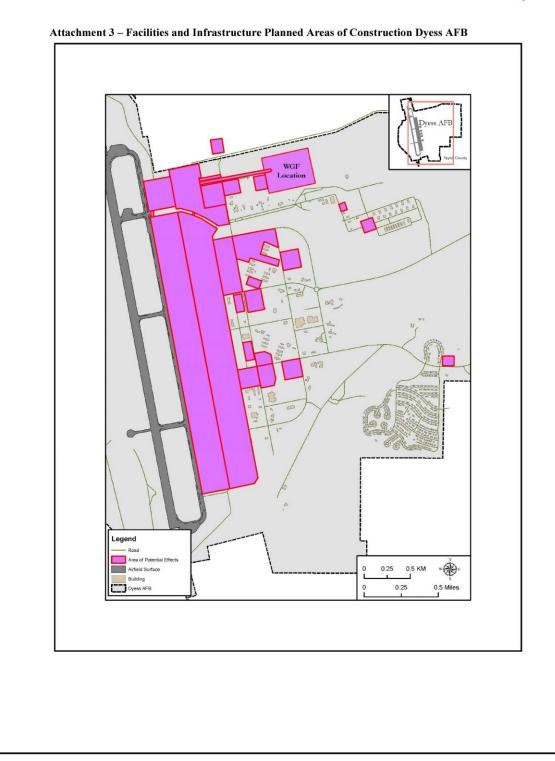
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NOVEMBER 2023









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

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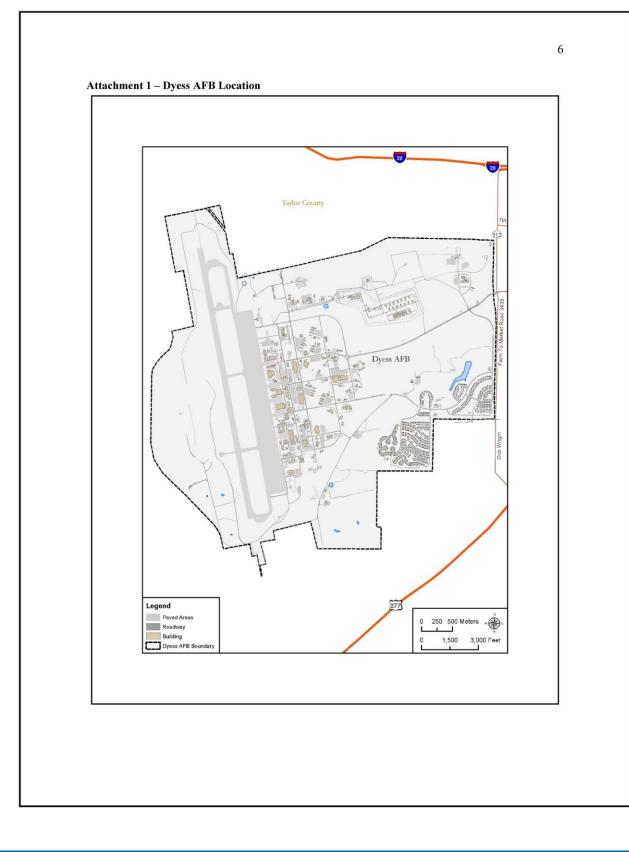
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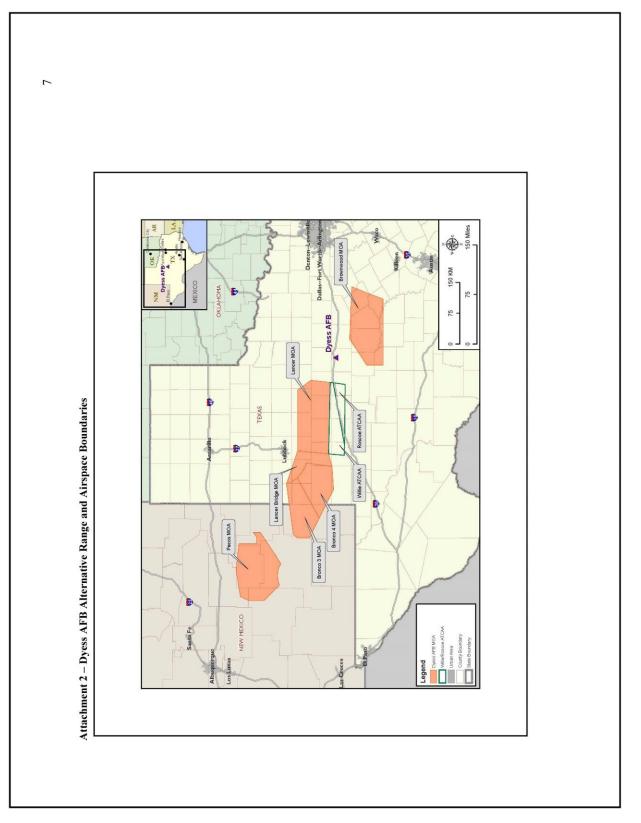
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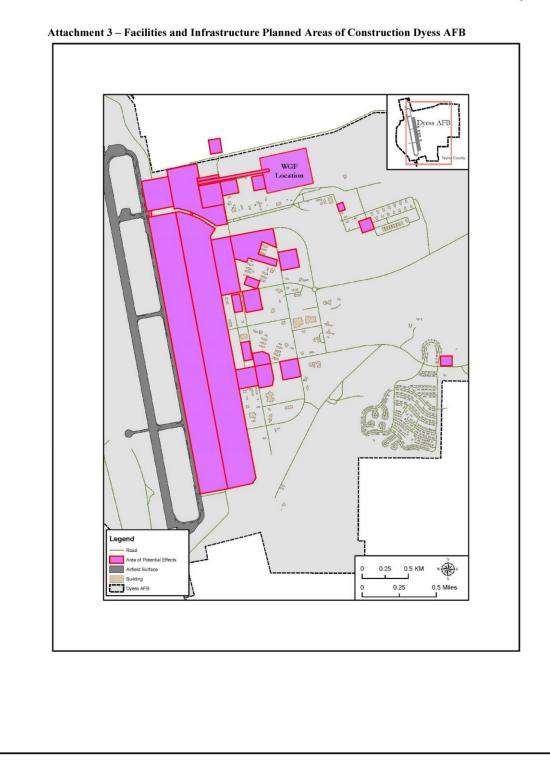
4 If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you. Sincerely Len JOSEPH K. KRAMER, Colonel, 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 Coma	anche 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 Dyest AFB, Texas, or Whiteman AFB, Missouri.
	Historic properties of religious and cultural significance to the Comanche Nation are present on Dyess AFB or within the project's APE, and the tribe desires to consult or these and future projects.
	Additional comments or concerns may be written below or by separate attachment:
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NOVEMBER 2023









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.

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 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

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.

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
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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

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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)
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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)

Table 1. 1	Facilities and	Infrastructure	for the Dyess	AFB Alternative	
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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.

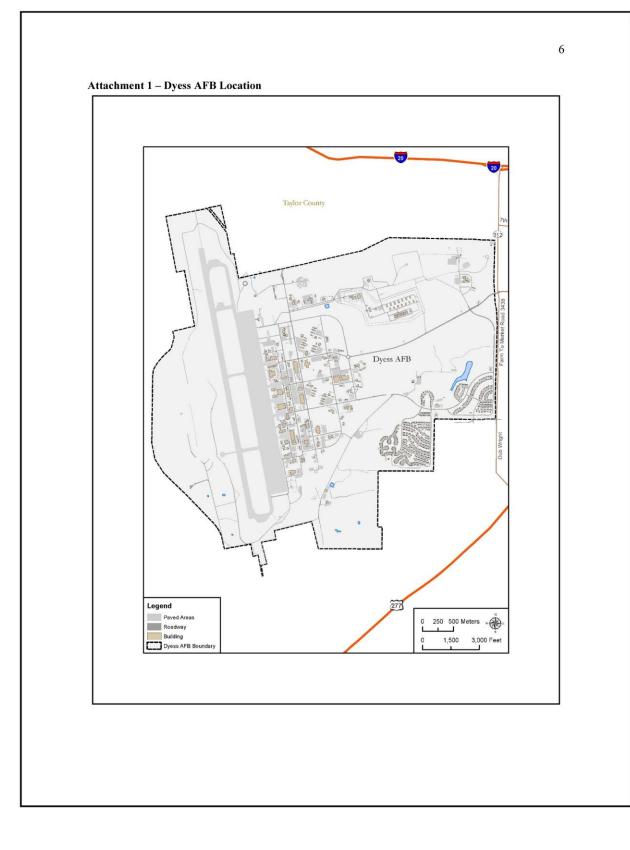
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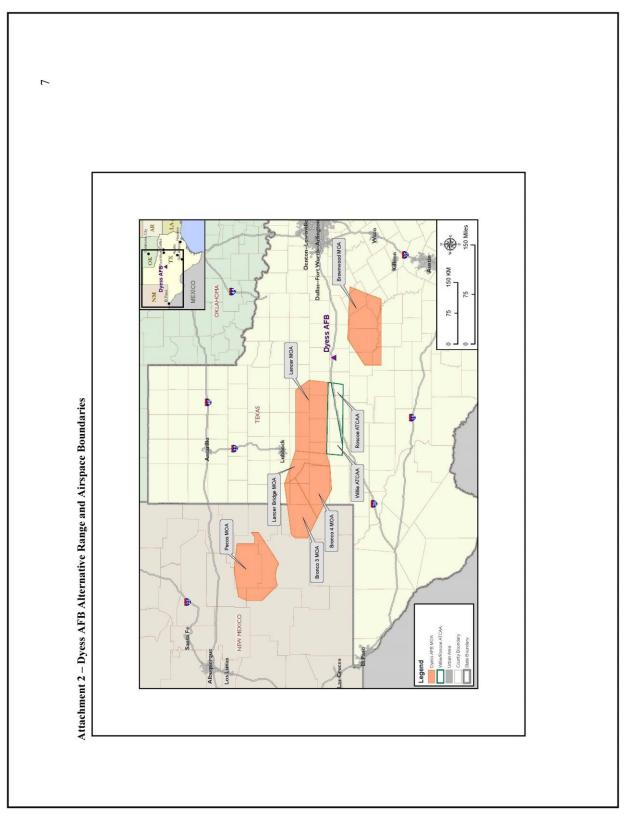
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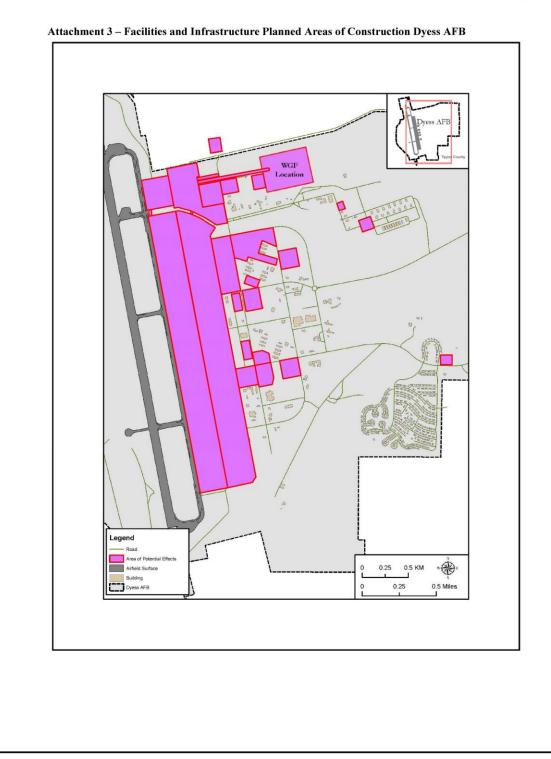
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The Fort S	Sill Apache Tribe of Oklahoma has determined that:
	There is a potential for significant sites to the Fort Sill Apache Tribe of Oklahoma would like to visit/investigate.
	Historic properties of religious and cultural significance to the 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:
-	le of designated contact for this proposed project:
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NOVEMBER 2023









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

1

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

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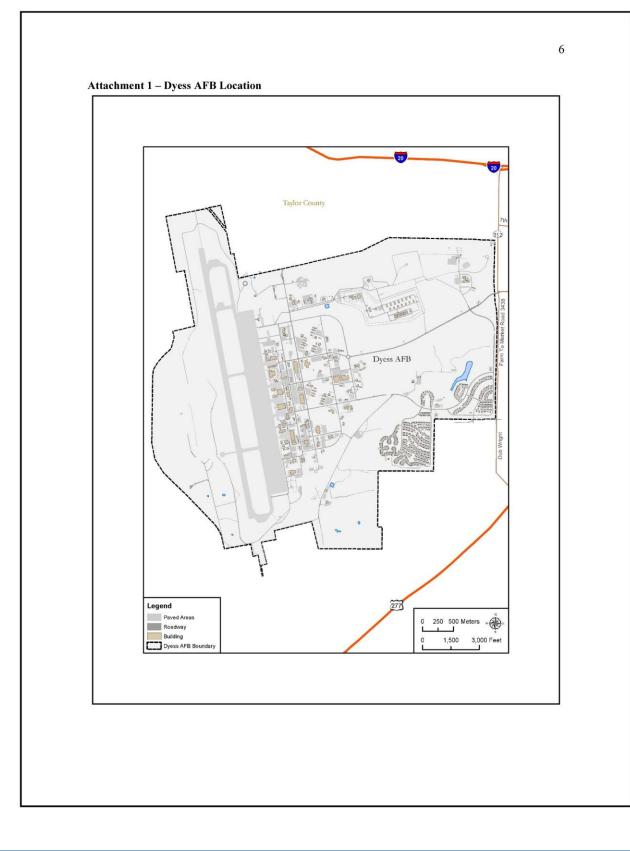
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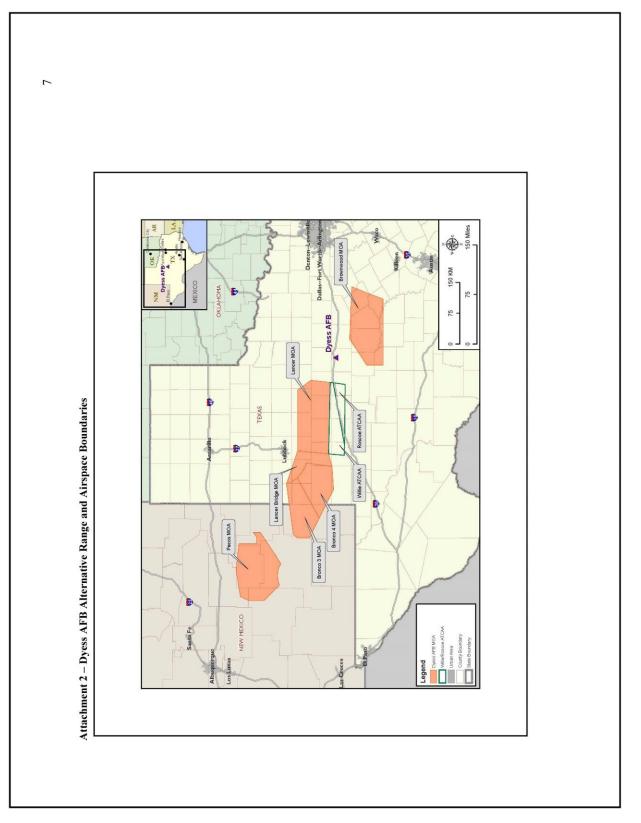
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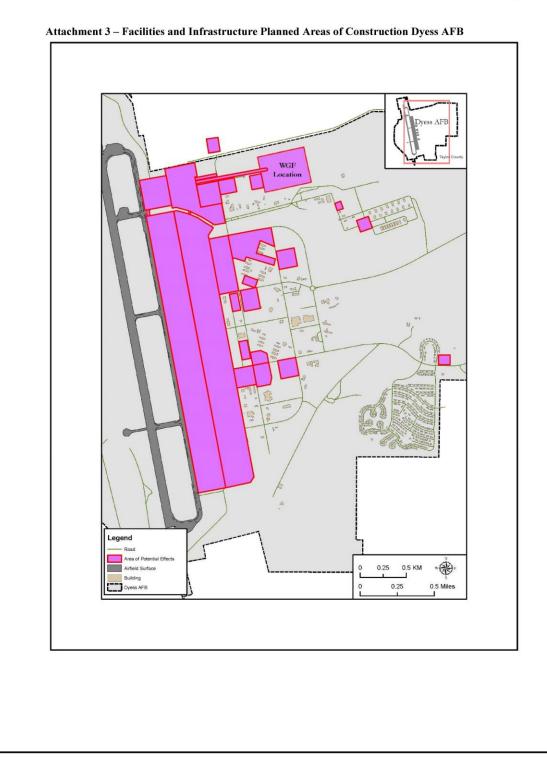
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The Jicarilla Apache Nation has determined that: The Jicarilla Apache Nation has determined that: There is a potential for significant sites to the Jicarilla Apache Nation would like to visit/investigate. Historic properties of religious and cultural significance to the Jicarilla Apache 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 Jicarilla Apache 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. Historic properties of religious and cultural significance to the Jicarilla Apache Nation are present on Dyess AFB or within the project's APE, and the tribe desires t consult on these and future projects. Additional comments or concerns may be written below or by separate attachment: Additional comments or concerns may be written below or by separate attachment: Historic properties of religious project: There is a Additional contact for this proposed project: Date: Date:	
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Signature: Date:	
Date:	

NOVEMBER 2023









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.

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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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

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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)

Table 1. 1	Facilities and	Infrastructure	for the Dyess	AFB Alternative	
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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.

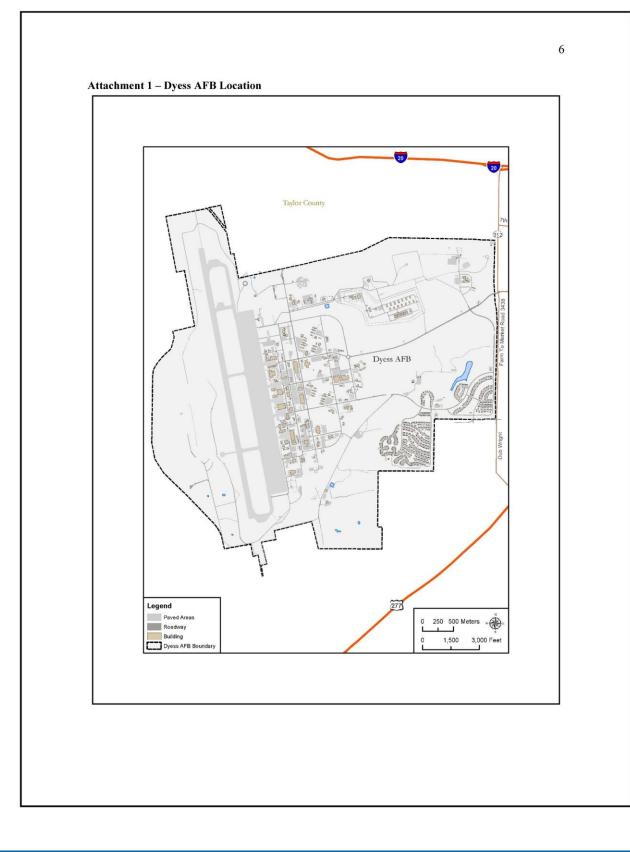
Please indicate below whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, 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.

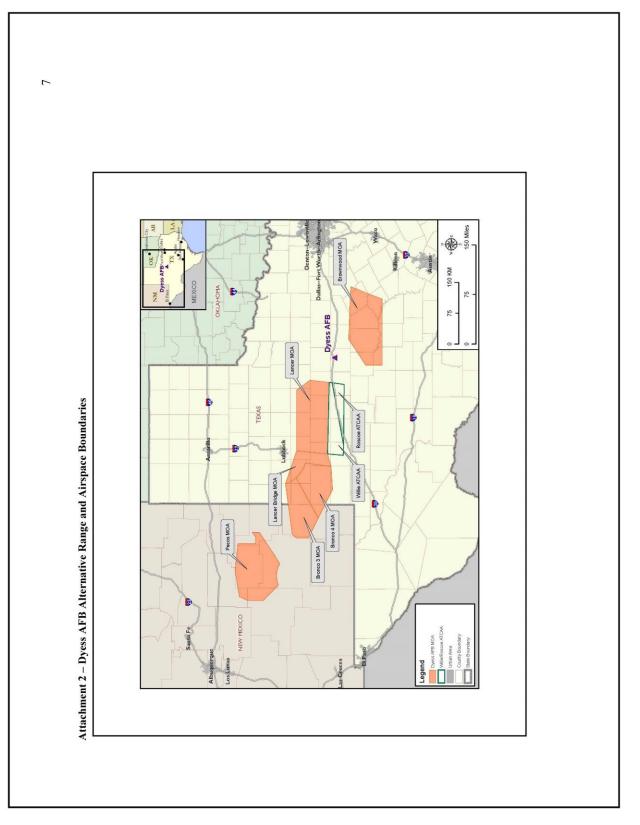
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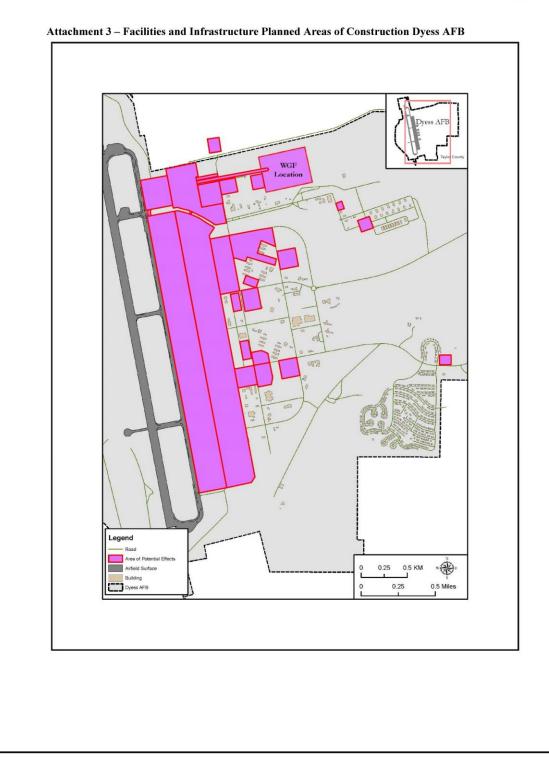
4 If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you. Sincerely Len JOSEPH K. KRAMER, Colonel, 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 Kicka	poo 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 tim 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:
3 <u></u>	
Name/Title	e of designated contact for this proposed project:
Phone:	
E-mail:	
Signature:	
Date:	

NOVEMBER 2023









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.

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.

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
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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)
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)
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BOS – Dorm (Estimated 144-Person Occupancy)	83,757	New
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BOS – Youth Center	8,387	Addition (Bldg. 11902)
BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Table 1. Facilities and Infrastructure for the Dye	s AFB Alternative	
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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.

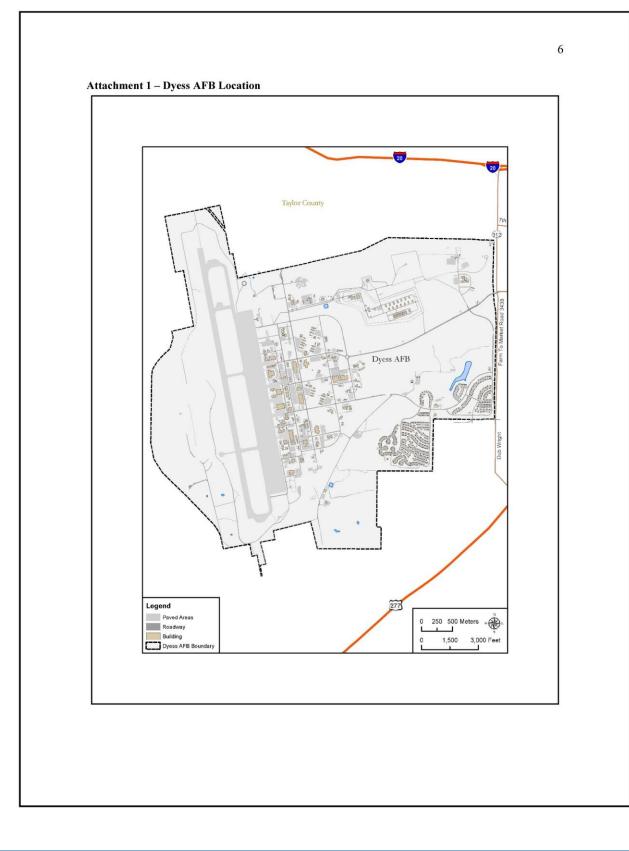
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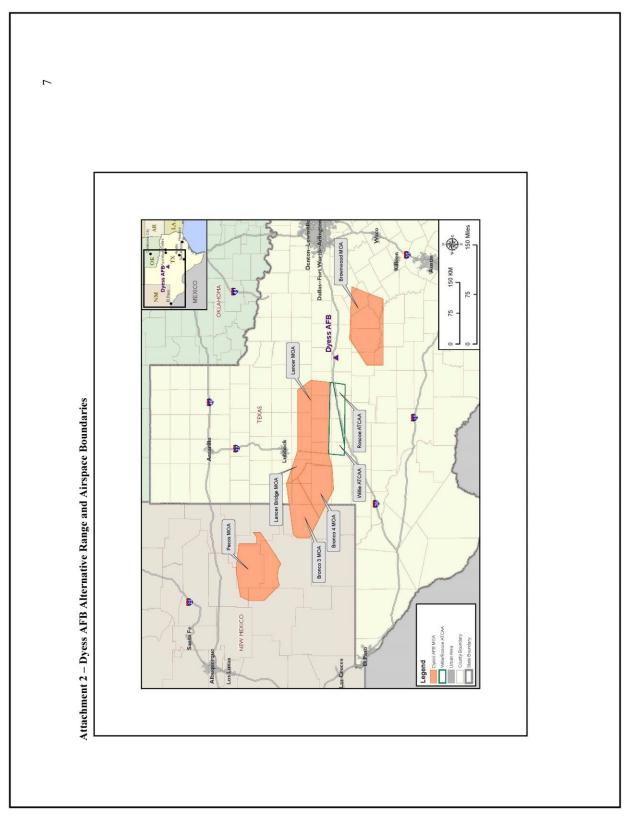
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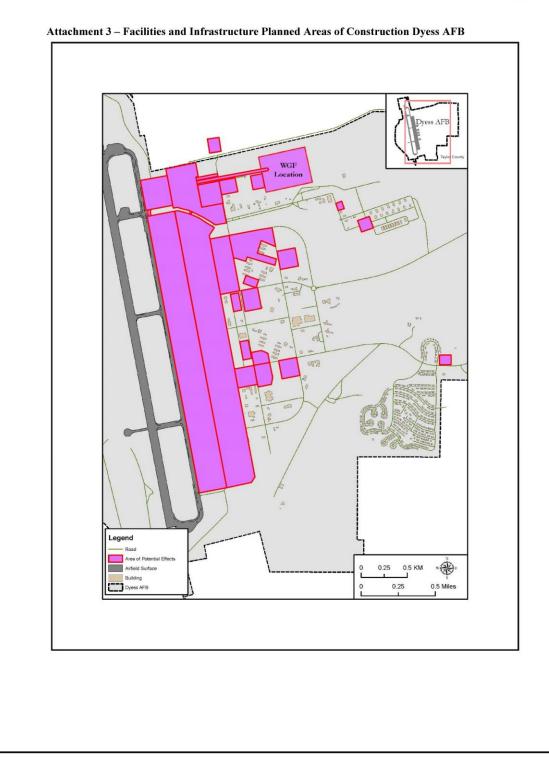
If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you. Sincerely Len JOSEPH K. KRAMER, Colonel, 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 Kiow	a Tribe of Oklahoma has determined that:
	There is a potential for significant sites to the Kiowa Tribe of Oklahoma would like t 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.
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NOVEMBER 2023









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

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

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 Mescalero Apache Tribe. 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 Mescalero Apache Tribe 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

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BOS – Fitness Center	33,500	Addition (Bldg. 7104)
BOS – Dining Facility	4,000	Addition (Bldg. 6132)

Table 1.	Facilities and	Infrastructure	for the Dyess	AFB Alternative	
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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.

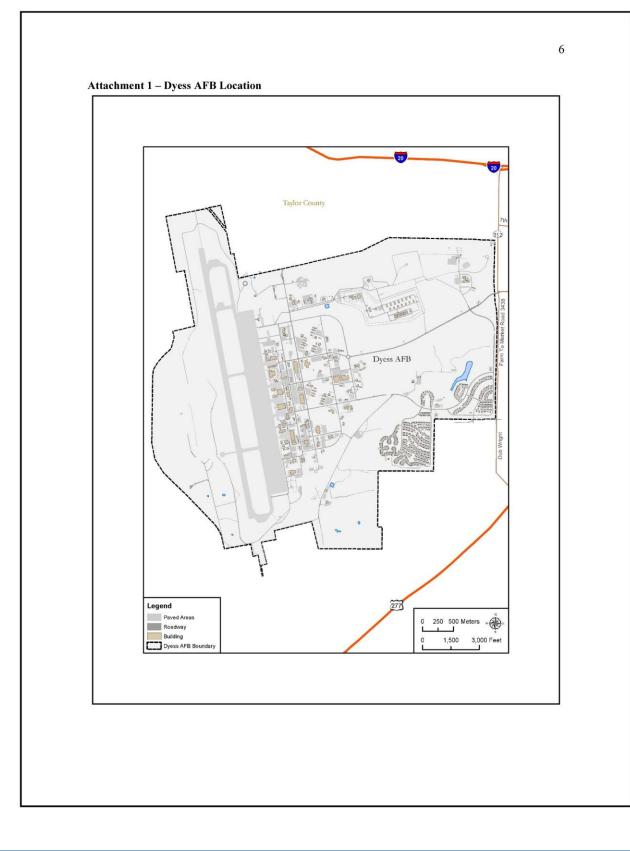
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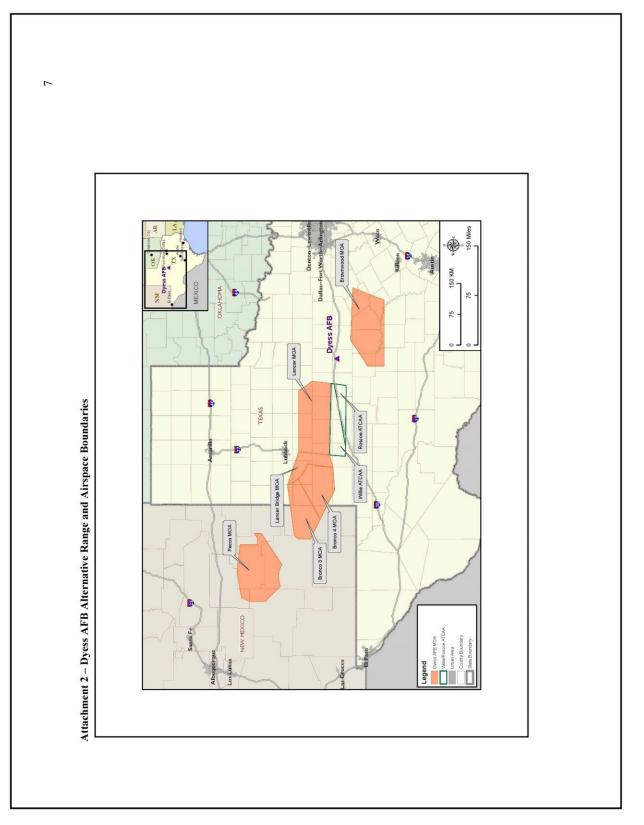
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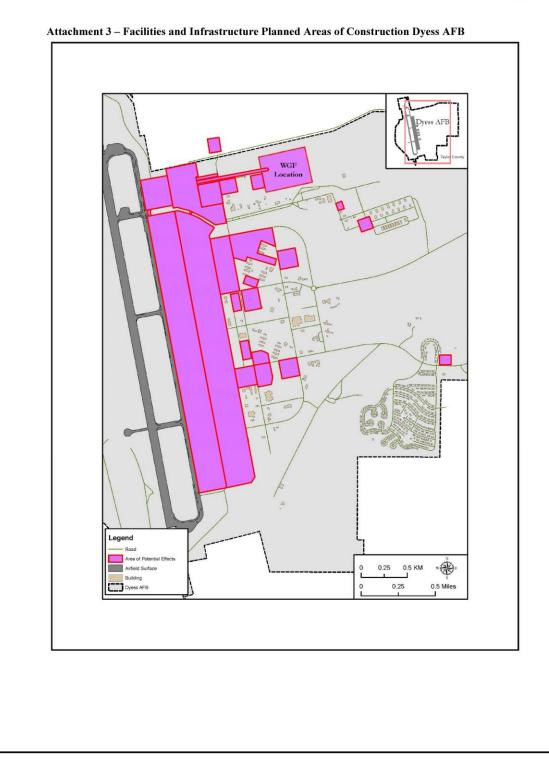
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The Mesc	alero Apache Tribe has determined that:
	There is a potential for significant sites to the Mescalero Apache Tribe would like to visit/investigate.
	Historic properties of religious and cultural significance to the Mescalero Apache Tribe are 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 Mescalero Apache Tribe 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 Mescalero Apache Tribe 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:
-	
-	le of designated contact for this proposed project:
Phone:	le of designated contact for this proposed project:
Phone:	le of designated contact for this proposed project:
Phone: E-mail:	le of designated contact for this proposed project:
Phone: E-mail: Signature	le of designated contact for this proposed project:
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NOVEMBER 2023









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

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

Dear President Martin

1

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 Tonkawa Tribe of Indians 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 Tonkawa Tribe of Indians 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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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.

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

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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
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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)

Table 1.	Facilities and	Infrastructure	for the Dyess	AFB Alternative	
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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.

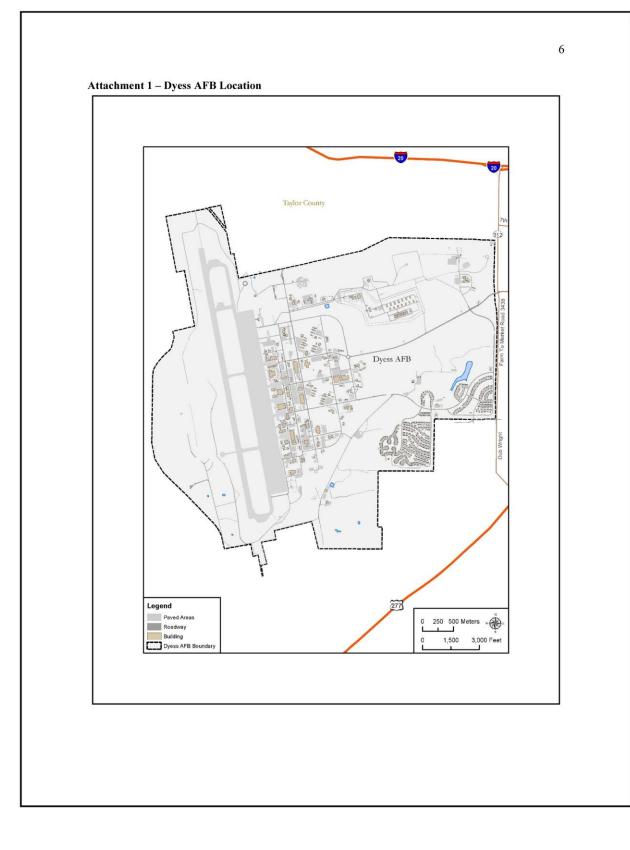
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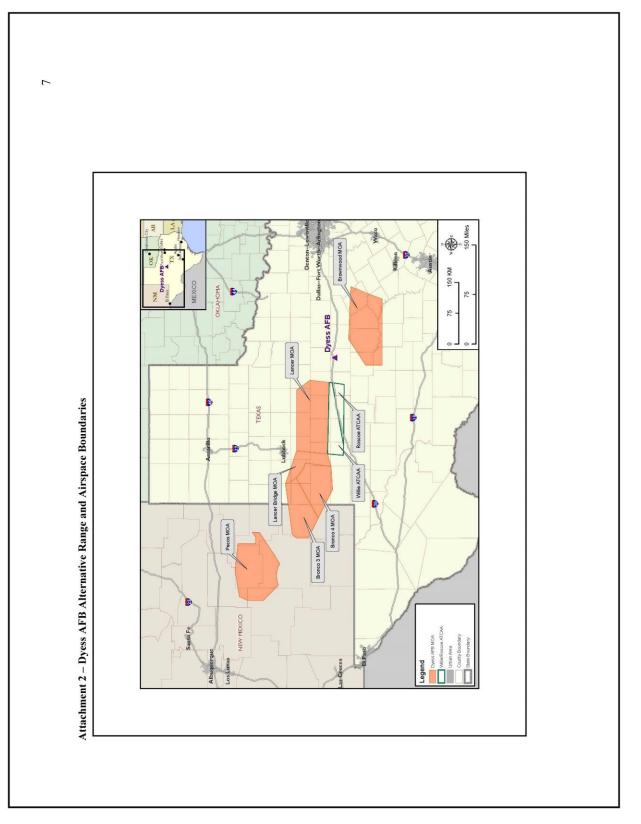
If you have any questions, please contact Mr. Bryan Foreman (AFGSC 7 CES/CENP), Dyess AFB Point of Contact at 325.696.8659 or by email at Bryan.Foreman@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you. Sincerely Len JOSEPH K. KRAMER, Colonel, 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

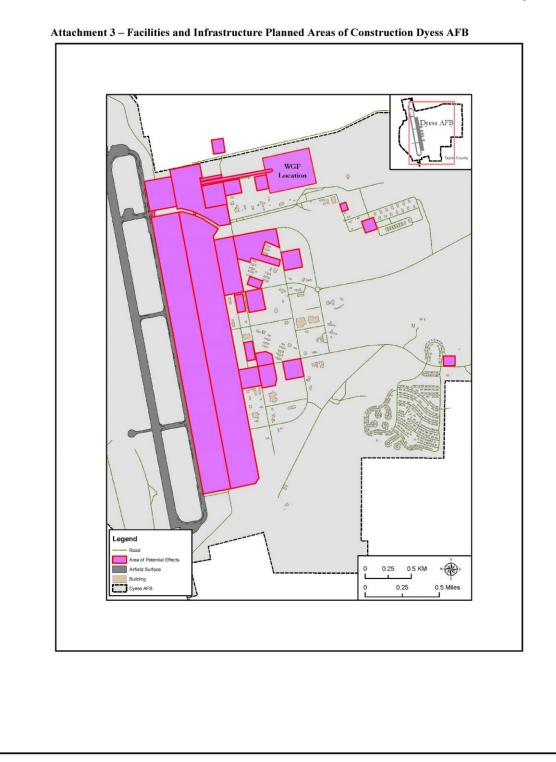
The Tonk	awa Tribe of Indians of Oklahoma has determined that:
	There is a potential for significant sites to the Tonkawa Tribe of Indians of Oklahon would like to visit/investigate.
	Historic properties of religious and cultural significance to the Tonkawa Tribe of Indians of Oklahoma are not present 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 Bas 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/Tit	le of designated contact for this proposed project:
Name/Tit	
Phone:	le of designated contact for this proposed project:
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NOVEMBER 2023



E-70







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

1

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

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.

Facility	Size (Square Feet)	Building Type
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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

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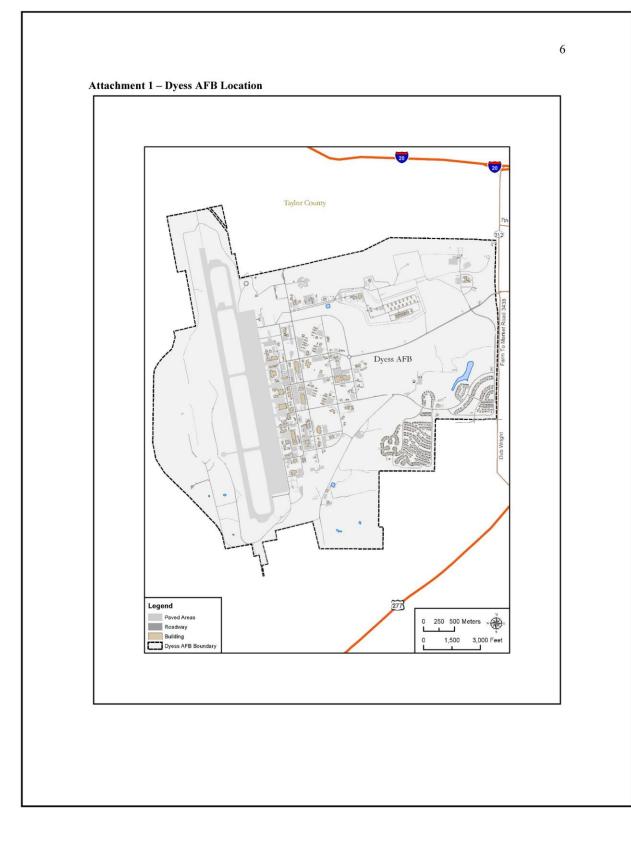
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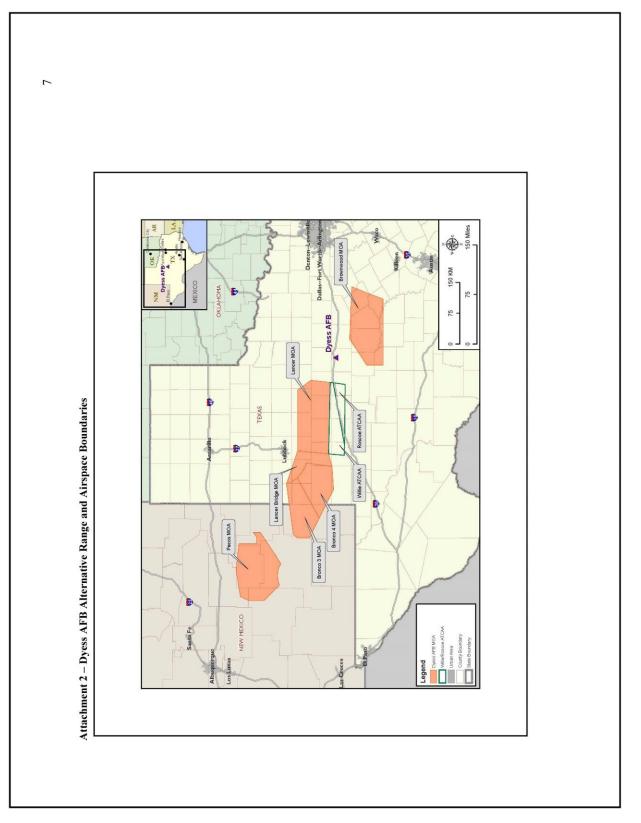
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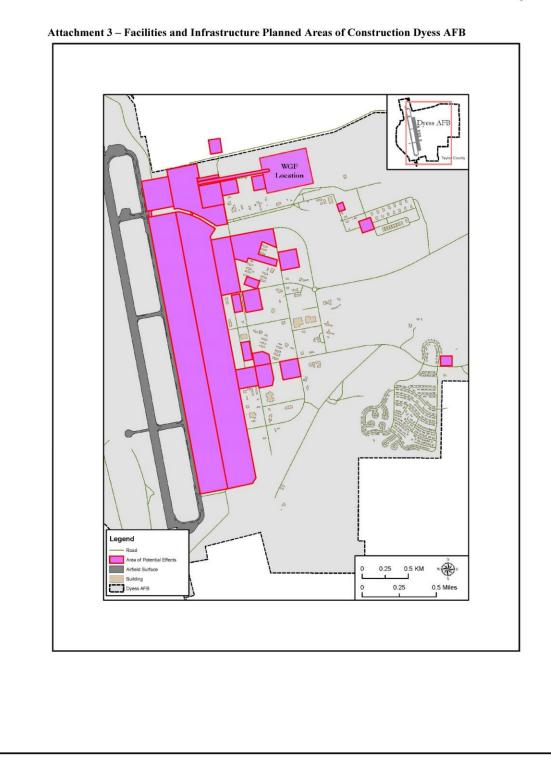
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NOVEMBER 2023



E-78







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

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Table 1. Facilities and Infrastructure for the Dyess AFB Alternative

Facility	Size (Square Feet)	Building Type		
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Table 1. Fa	acilities and I	nfrastructure f	or the Dyess	AFB Alternative
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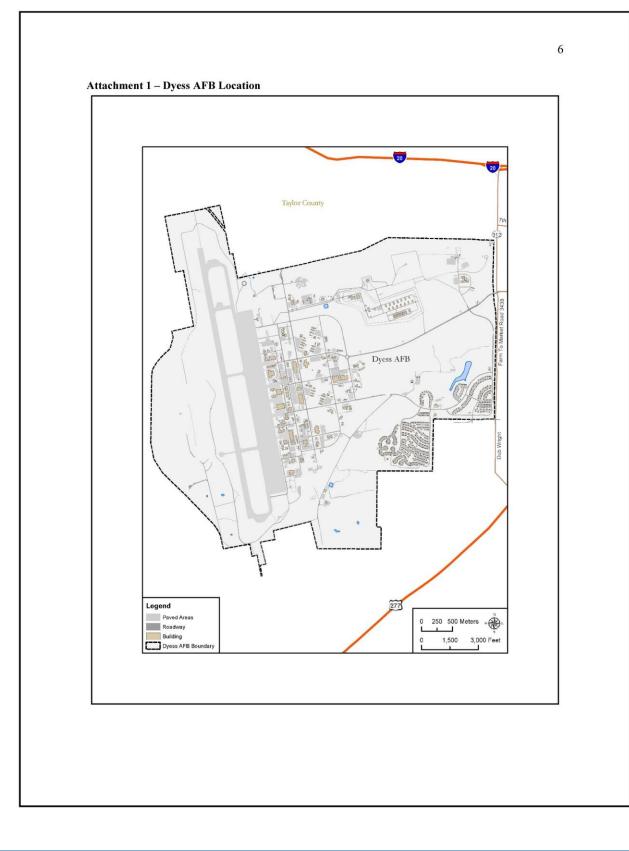
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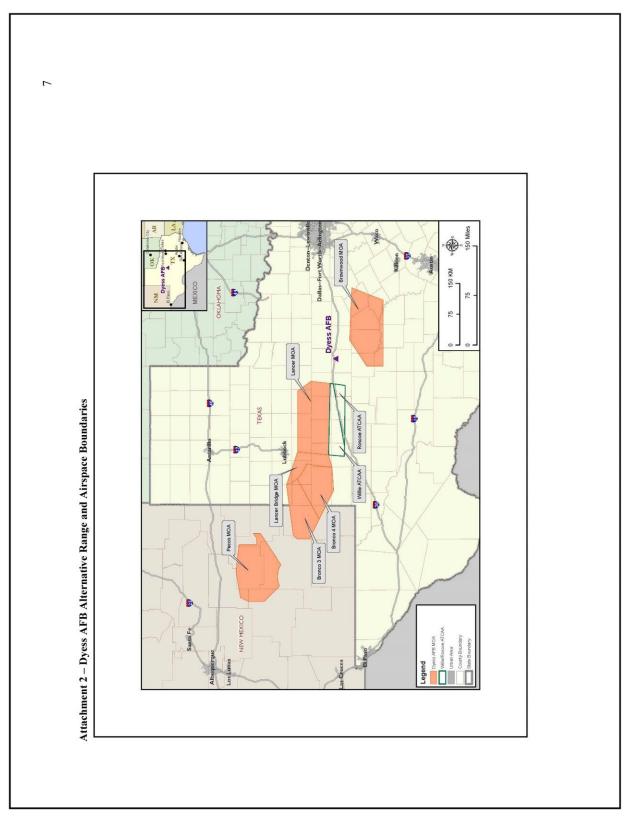
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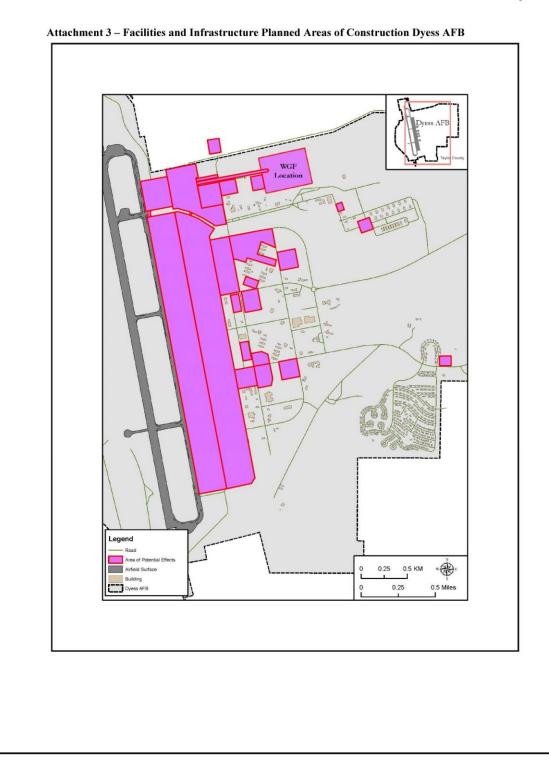
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The Yslet	a Del Sur Pueblo has determined that:
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NOVEMBER 2023







1 E.1.1.1 Tribal Responses

-	SC 7 CES/CENP <bryan.foreman@us.af.mil> D Source] B-21 Main Operating Base (MOB) 2 or MOB 3 Beddor</bryan.foreman@us.af.mil>	wn at Dyess Air
Bryan		
	tion, received on 07-24-2023. The Caddo Nation appreciates y to Section 106 of the National Historic Preservation Act.	our willingness to
sites of interest to the Caddo Nation. A in the event that an inadvertent discove occurs, we request that the project be i	I have determined that it does not affect known cultural, trad s such, the Caddo Nation has no objection to the project at this rry of potentially relevant cultural sites, funerary objects, or hu mmediately halted and the proper authorities be contacted. A d of an inadvertent discovery with 24 hours.	s time. However, man remains
Should you have any question or conce	ns regarding this response please feel free to contact our offic	e.
Best regards,		
lonathan		
Jonathan M. Rohrer Iribal Historic Preservation Officer	Caddo Nation	
Caddo Nation P.O. Box 487 Binger, OK 73009 : (405)656-0970 Ext. 2070 e: jrohrer@mycaddonation.com		
www.mycaddonation.com		
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1 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.

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	0 Renovation/Addition (Bldg. 5208)		
Weapons Load Trainer (2-Bay)	60,225	New		
Hangar 4	29,225	Demolition		
Cockpit Procedure Trainer	29,383	Demolition (Bldg. 706)		
Cockpit Procedure Trainer	5,000	New		
Chadwell Cockpit Procedure Trainer	5,000	New		
Special Access Program Space	38,209	P Renovation (Bldg. 509)		
Simulator Facility (Phase 1)	92,511	1 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)		

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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.

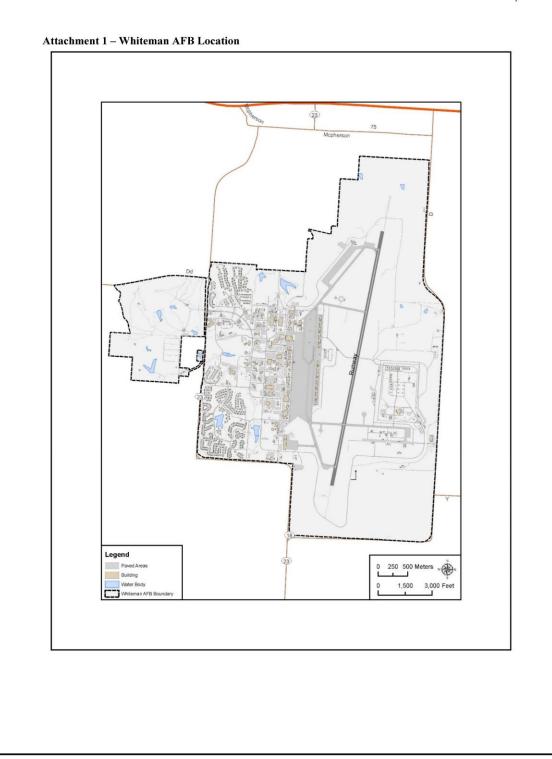
Please indicate below in the attached questionnaire whether you are interested in providing information or would like to consult on this undertaking. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary 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.

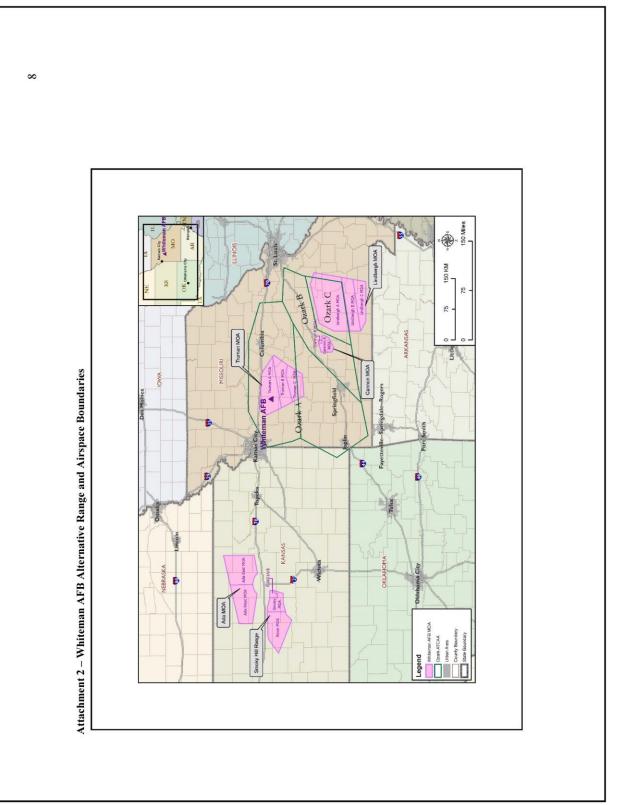
5 If you have any questions, please contact Mr. Chris Moore (AFCEC/CZN), AFCEC Point of Contact at 512.417.3715 or by email at christopher.moore.114@us.af.mil. Thank you in advance for your assistance in this effort. Sincerely KEITH J. BOTLER, Colonel, USAF Commander Attachments: Attachment 1 Whiteman AFB Location Attachment 2 Whiteman AFB Alternative Range and Airspace Boundaries Attachment 3 Facilities and Infrastructure Planned Areas of Construction Whiteman AFB

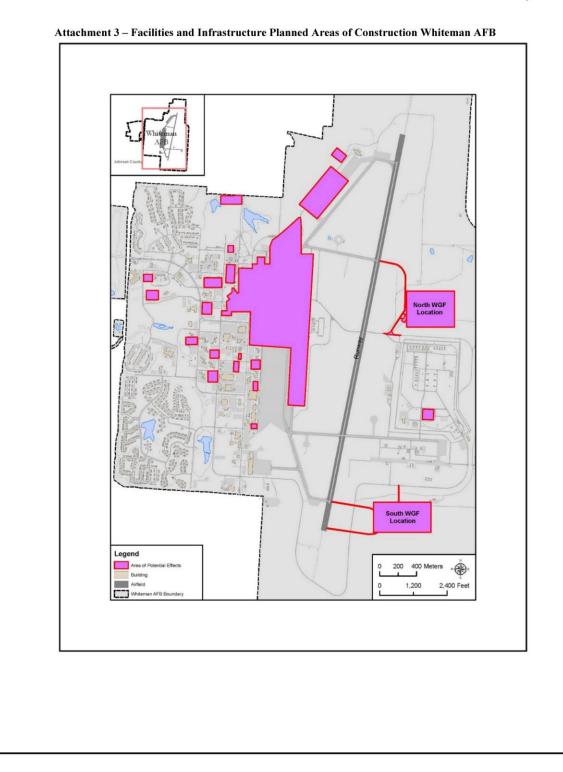
	me: B-21 Main Operating Base (MOB) 2 or MOB 3 Beddown at Dyess Air Force 3), Texas, or Whiteman AFB, Missouri Environmental Impact Statement (EIS)
or additio phone to I	eck the appropriate response(s) from the list below and use the back of the form nal sheets if you wish to make comments. You may also respond via e-mail or Mr. Chris Moore, AFCEC point of contact at 512.417.3715 or er.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	e of designated contact for this proposed project:
Phone:	
E-mail:	
Signature:	

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1 E.2 STATE HISTORIC PRESERVATION OFFICER (SHPO) CONSULTATION

2 E.2.1 Dyess Air Force Base

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3 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 Alterna	Table	1. F:	acilities and	Infrastructure	for the D	vess AFB	Alternative
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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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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; ft³ = cubic feet

Note:

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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

K.Kruv

JOSEPH K. KRAMER, Colonel, USAF Commander

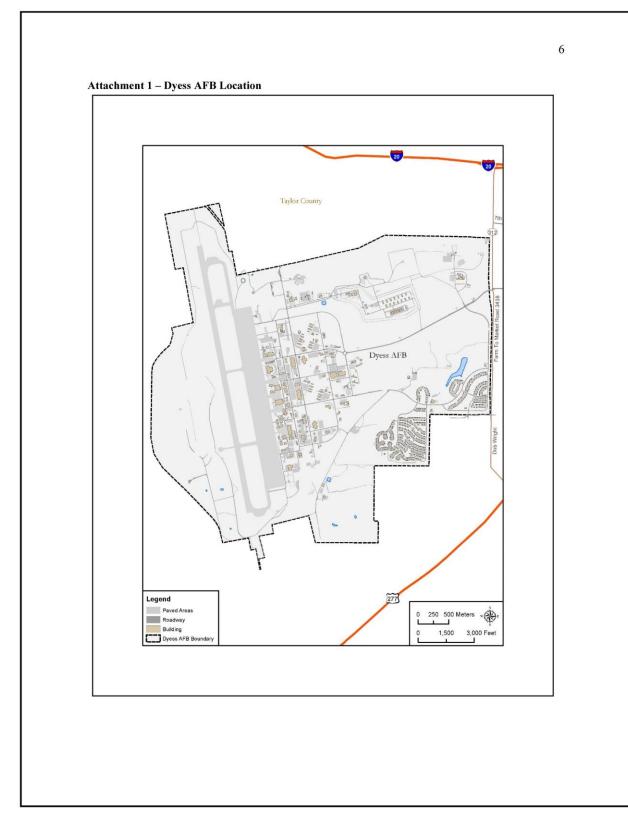
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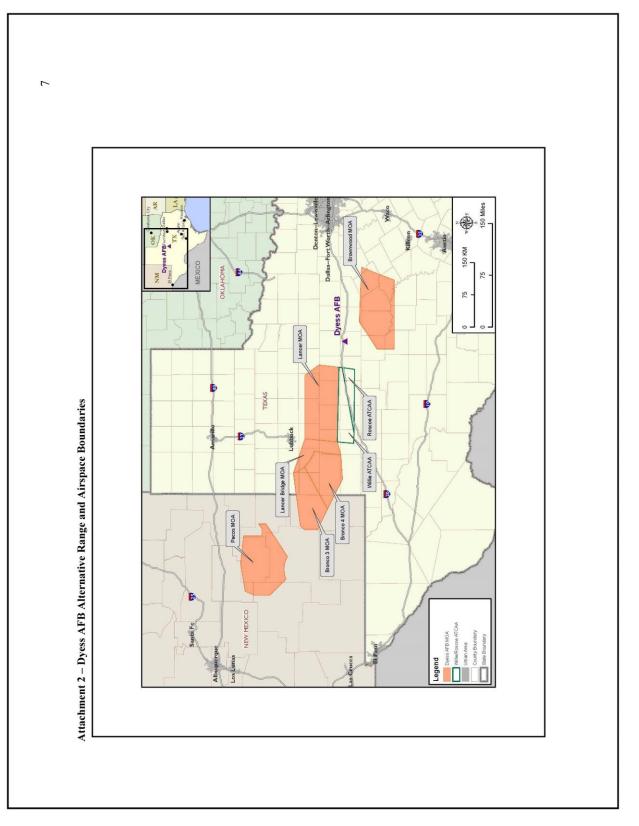
Attachment 1 Dyess AFB Location

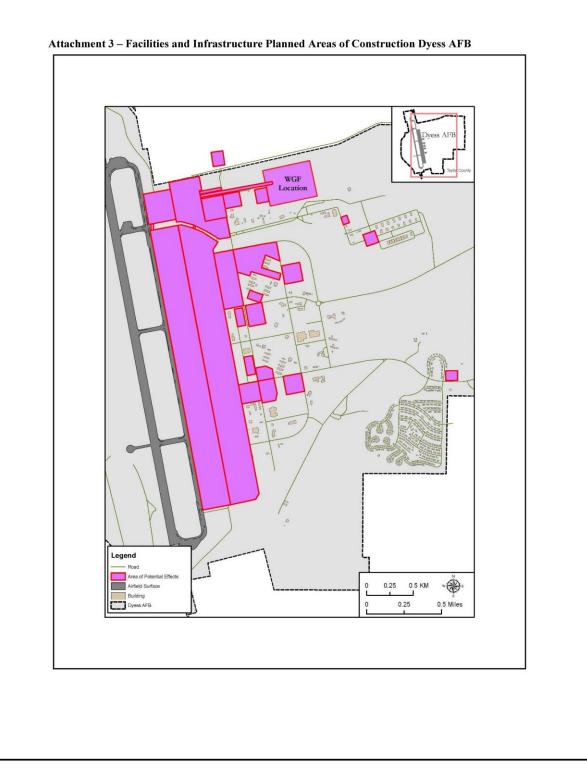
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries Attachment 3 Facilities and Infrastructure Planned Areas of Construction Dyess AFB

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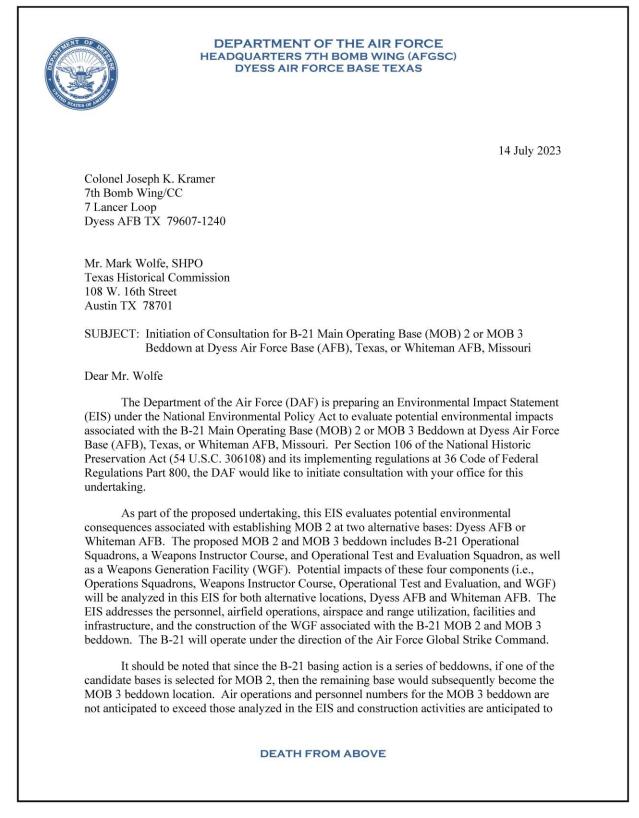
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1 E.2.1.2 Texas Historical Commission



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 Alterna	Table	1. F:	acilities and	Infrastructure	for the D	vess AFB	Alternative
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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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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; ft³ = cubic feet

Note:

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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

K.Kruv

JOSEPH K. KRAMER, Colonel, USAF Commander

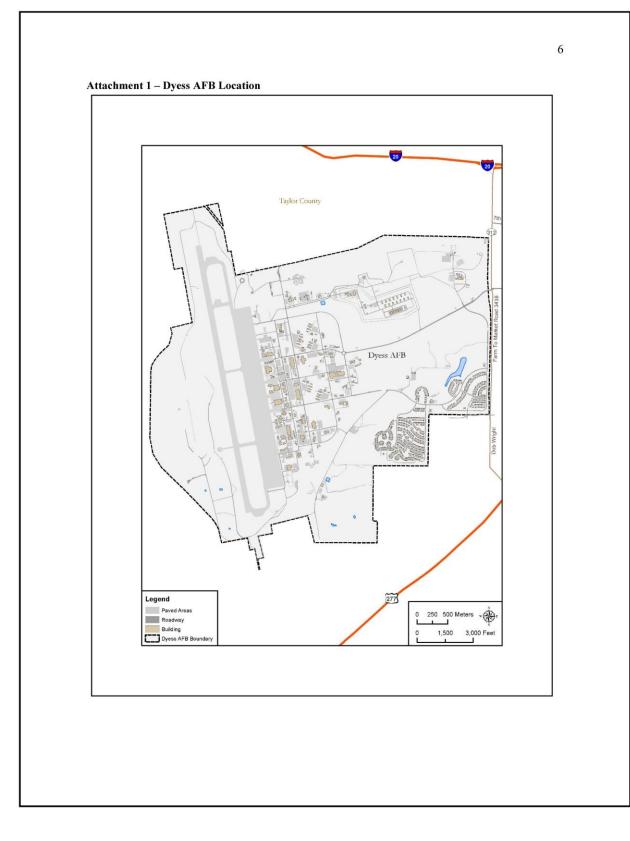
Attachments:

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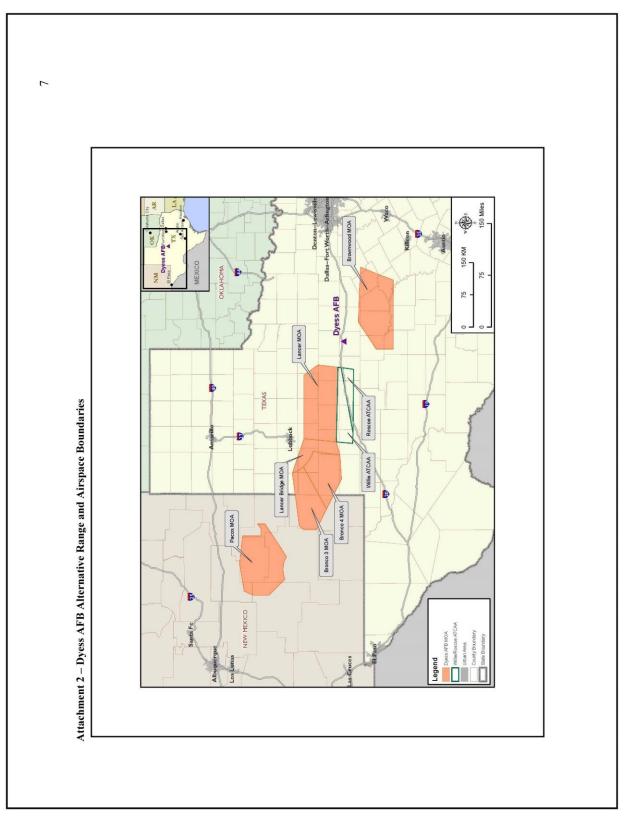
Attachment 1 Dyess AFB Location

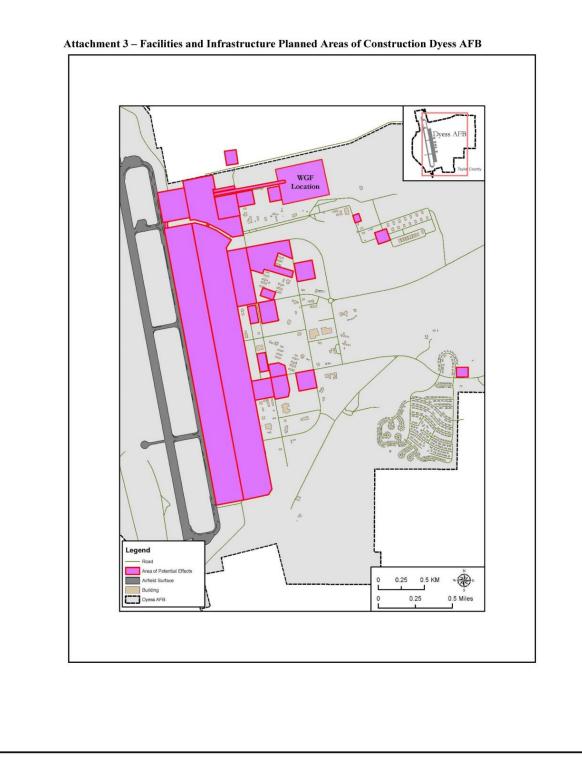
Attachment 2 Dyess AFB Alternative Range and Airspace Boundaries Attachment 3 Facilities and Infrastructure Planned Areas of Construction Dyess AFB E-111

E-112



E-113





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1 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 <<u>bryan.foreman@us.af.mil</u>>; 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 abovereferenced 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: <u>tiffany.osburn@thc.texas.gov</u>, 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 <u>http://thc.texas.gov/etrac-system</u>.

Sincerely,

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for Mark Wolfe, State Historic Preservation Officer Executive Director, Texas Historical Commission

1 E.2.2 Whiteman Air Force Base

2 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.

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	Demolition (Bldg. 706)	
Cockpit Procedure Trainer	5,000	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

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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

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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. E-119

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.

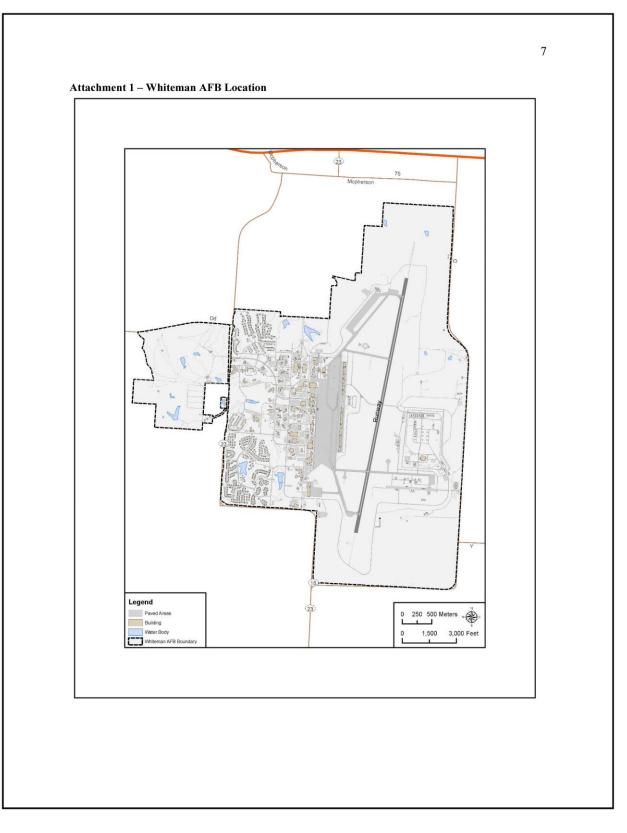
A review of NRHP records identified eight listed properties beneath the Ada West MOA in Kansas. Representative properties include the Salt Creek Truss Leg Bedstead Bridge; Pott's Ford Bridge; and Mitchell County Courthouse. Five listed properties are located beneath the Ada East MOA in Kansas. These 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.

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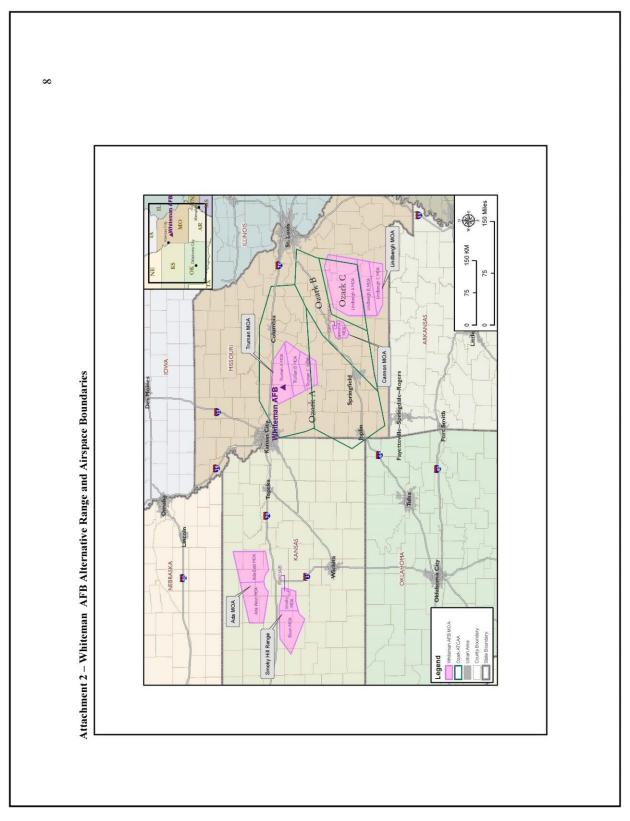
DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

6 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 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

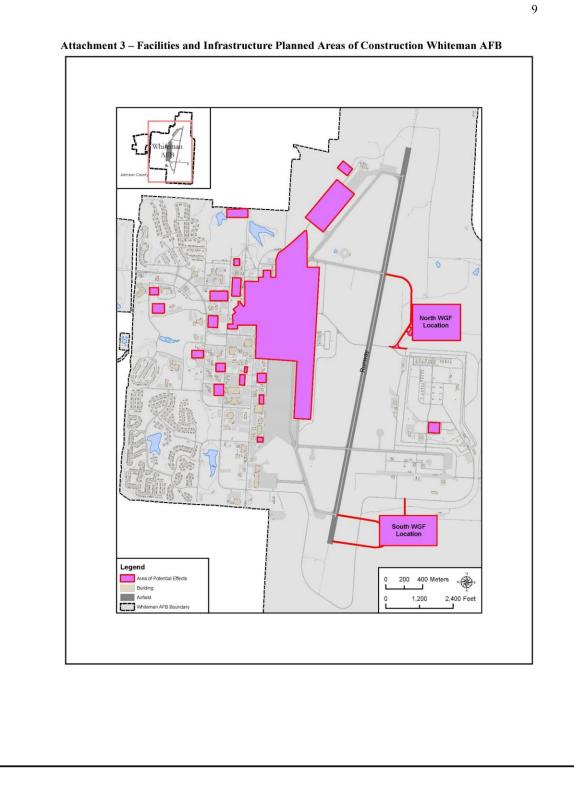


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E-123







E-126

1 Correspondence from Missouri SHPO dated August 16, 2023



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

Joni 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





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

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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.

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Snow Removal Areas	100,000	New	
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Table 1. Facilities and Infrastructure for the Whiteman AFB Alternative

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General Maintenance Hangars (14)	26,500 x 14 = 371,000	Renovation (Docks 1-14)	
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Table 1.	Facilities and	Infrastructure	for the Whiteman	AFB Alternative
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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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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.

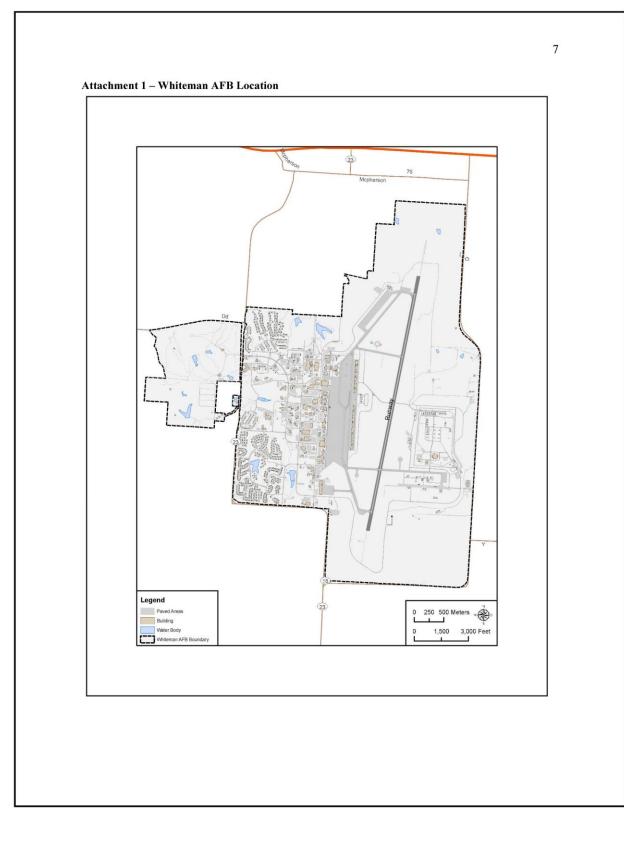
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There is one NRHP-listed district under the Lindbergh MOA: the Houston Ranger Station Historic District.

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.

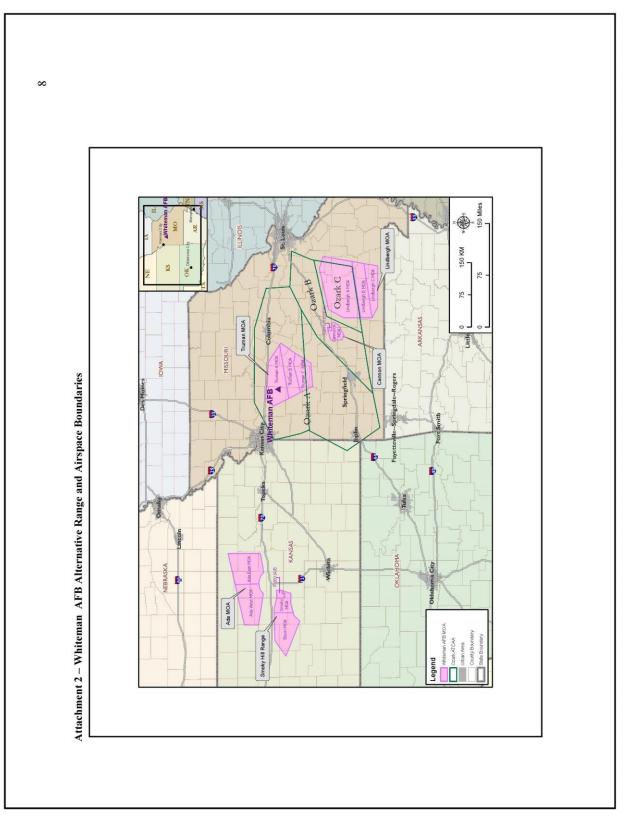
A review of NRHP records identified 18 NRHP-listed properties or districts beneath the Smoky Hill Range in Kansas. Representative properties include the Fort Harker Officers Quarters, the Aurthur Larkin House, Ellsworth Downtown Historic District, and the Beaver Creek Native Stone Bridge.

6 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 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



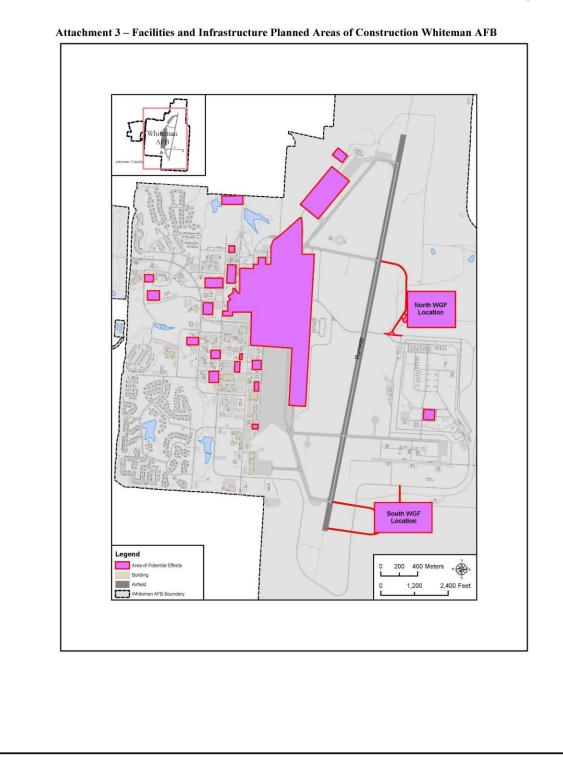
E-134

NOVEMBER 2023



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E-13<u>5</u>



DRAFT | ENVIRONMENTAL IMPACT STATEMENT B-21 MOB 2 OR MOB 3 BEDDOWN AT DYESS AFB OR WHITEMAN AFB

E-136

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NOVEMBER 2023 E-137

1 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

Laura Kelly, Governor

Patrick Zollner, Executive Director

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 <u>Katrina.Ringler@ks.gov</u> 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

1 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.

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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.

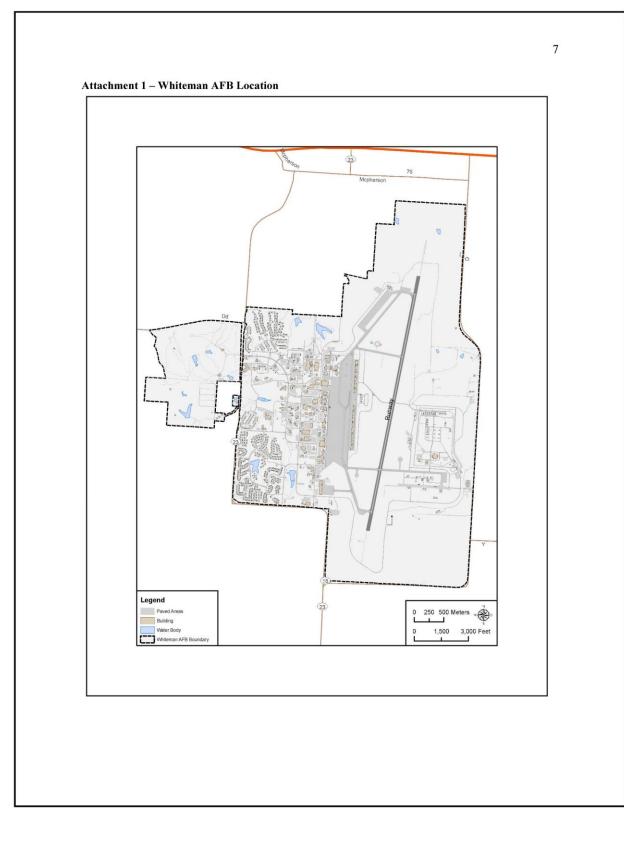
A review of NRHP records identified 18 NRHP-listed properties or districts beneath the Smoky Hill Range in Kansas. Representative properties include the Fort Harker Officers Quarters, the Aurthur Larkin House, Ellsworth Downtown Historic District, and the Beaver Creek Native Stone Bridge.

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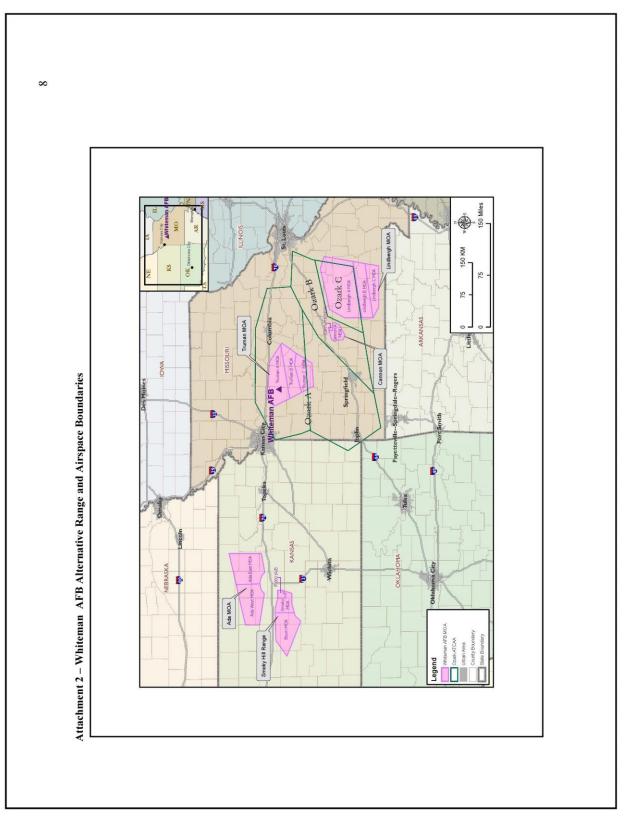
6 If you have any questions, please contact Mr. Chris Moore (AFCEC/CZN), AFCEC Point of Contact at 512.417.3715 or by email at christopher.moore.114@us.af.mil. Thank you in advance for your assistance in this effort. Sincerely KEITH BUTLER, Colonel, USAF Commander Attachments: Attachment 1 Whiteman AFB 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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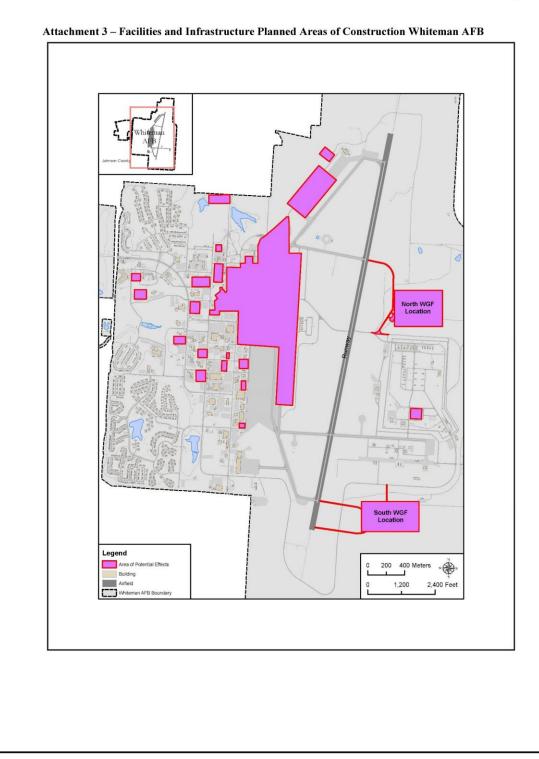


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