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ENVIRONMENTAL ASSESSMENT FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT TO EIELSON AIR FORCE BASE, ALASKA

Photo: U.S. Air Force/Staff Sgt. Christopher Boitz, 2011

Prepared by:
Department of the Air Force

December 2022

Letters or other written comments provided may be published in the Final EA. As required by law, substantive comments will be addressed in the Final EA and made available to the public. Any personal information provided will be kept confidential. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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ACRONYMS AND ABBREVIATIONS

μg/kg	micrograms per kilogram
μg/L	micrograms per liter
μg/m^3	microgram per cubic meter
%	percent
168 WG	168th Wing
354 FW	354th Fighter Wing
AAC	Alaska Administrative Code
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADOLWD	Alaska Department of Labor and Workforce Development
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	aqueous fire-fighting foam
AFI	Air Force Instruction
AFMAN	Air Force Manual
AGE	aerospace ground equipment
AGL	Above Ground Level
AHRS	Alaska Heritage Resource Survey
AICUZ	Air Installation Compatible Use Zone
AKANG	Alaska Air National Guard
AMC	Air Mobility Command
ANG	Air National Guard
APDES	Alaska Pollutant Discharge Elimination System
APE	area of potential effect
APZ	Accident Potential Zone
BASH	Bird/Wildlife Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
bldg	building
BLM	Bureau of Land Management
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
Census	U.S. Census Bureau
CEQ	Council on Environmental Quality
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CH&PP	Central Heat & Power Plant
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent

ACRONYMS AND ABBREVIATIONS (CONTINUED)

COC	contaminant of concern
CONUS	Continental United States
COPC	contaminant of potential concern
CTK	Composite Tool Kit
CWA	Clean Water Act
CZ	Clear Zone
DAF	Department of the Air Force
dB	decibels
dBA	A-weighted decibels
dBC	C-weighted decibels
DCE	dichloroethylene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloro-ethylene
DDT	dichlorodiphenyltrichloroethane
DERP	Defense Environmental Restoration Program
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DOPAA	Description of Proposed Action and Alternatives
DRO	diesel range organics
EA	Environmental Assessment
EDB	ethylene dibromide
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FNSB	Fairbanks North Star Borough
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWA	Fort Wainwright
FWCA	Fish and Wildlife Coordination Act
FY	fiscal year
GPD	gallons per day
GRO	gasoline range organics
GVWR	gross vehicle weight rating
gw	groundwater
HAP	hazardous air pollutant
HVAC	heating, ventilation, and air conditioning
HWMP	Hazardous Waste Management Plan
ICRMP	Integrated Cultural Resources Management Plan

ACRONYMS AND ABBREVIATIONS (CONTINUED)

IDP	Installation Development Plan
IMP	Integrated Management Practice
INRMP	Integrated Natural Resource Management Plan
IPaC	Information for Planning and Conservation
JBER	Joint Base Elmendorf-Richardson
JPARC	Joint Pacific Alaska Range Complex
km	kilometers
kVA	kilovolt-amperes
lb/hr	pounds per hour
LBP	lead-based paint
Ldnmr	Onset Rate-Adjusted Monthly Day-Night Sound Level
Leq	Equivalent Sound Level
MBTA	Migratory Bird Treaty Act
MDG	Medical Group
mg/m^3	milligrams per cubic meter
MMPA	Marine Mammal Protection Act
MOA	Military Operating Areas
MTR	Military Training Routes
MWe	megawatts electric
MWt	megawatts thermal
MXG	Maintenance Group
N/A	not applicable
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NDI	non-destructive inspection
NDS	National Defense Strategy
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Rivers Inventory
NWI	National Wetland Inventory
O_3	ozone
O&M	operations and maintenance
OCONUS	Outside Continental United States

ACRONYMS AND ABBREVIATIONS (CONTINUED)

ODPCP	Oil and Hazardous Substance Discharge Prevention and Contingency Plan
OG	Operations Group
OHA	Alaska Office of History and Archaeology
OMRS	Operational Medical Readiness Squadron
ORVs	outstandingly remarkable values
OSHA	Occupational Safety and Health Administration
PAA	Primary Aircraft Assigned
PACAF	Pacific Air Force
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PCI	pavement condition index
pCi/L	picocuries per liter
PCP	pentachlorophenol
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PM_{10}	particulate matter less than 10 micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in aerodynamic diameter
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
RRO	residual range organics
SDWA	Safe Drinking Water Act
SecAF	Secretary of the Air Force
SEL	sound exposure level
SF	square feet
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office/Officer
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SVOC	semi-volatile organic compound
SWAP	State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethylene
TCP	Traditional Cultural Property
TMB	trimethylbenzene
TSCA	Toxic Substances Control Act
USAF	U.S. Air Force
USC	United States Code

ACRONYMS AND ABBREVIATIONS (CONTINUED)

USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
WOTUS	Waters of the United States
WS	Wildlife Services
WWTP	Wastewater Treatment Plant

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

Eielson Air Force Base (AFB) is located 23 miles (37 kilometers) southeast of Fairbanks, Alaska (Figure 1.1-1) and has been an active military base since 1944. It is the home of the 354th Fighter Wing (354 FW), serving as the hosting unit with F-16 C/D Fighting Falcon aircraft.

Eielson AFB supports six regular military tenant units, two of which have aircraft based at Eielson AFB. These include the Alaska Air National Guard (AKANG) 168th Wing (168 WG) with KC-135 Stratotanker aircraft, and the 210th Rescue Squadron Detachment 1 with HH-60 Pave Hawk helicopters. Other tenant units, which do not have based aircraft, include the Air Force Technical Applications Center Detachment 460; 66th Training Squadron Detachment 1, Arctic Survival School; 6th Field Investigations Region Detachment 632, Air Force Office of Special Investigations; 372nd Training Squadron Detachment 25; 732nd Air Mobility Squadron Operating Location A passenger terminal; Air Force Civil Engineer Center Field Operating Agency, Operating Location CE49; Air Force Legal Operating Agency Operating Location 0D4N, Area Defense Council; and the Air Combat Command Detachment 2, Operating Location 00PC. Both transient and special mission aircraft operate at Eielson AFB, particularly during major flying exercises.

This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts associated with the proposed relocation of four KC-135s as Primary Aircraft Assigned (PAA) to Eielson AFB. The addition would increase the total number of KC-135 aircraft to 12 total PAA. Air Mobility Command (AMC) would provide one aircraft from Battlefield Air Interdiction inventory, and the Pacific Air Force (PACAF) would provide three aircraft. To maintain efficient aircraft and airfield operations, approximately 254 additional personnel, plus their associated dependents, would be stationed at Eielson AFB. Additionally, the U.S. Air Force (USAF) would construct, renovate, or modify at least 12 facilities to accommodate the incoming aircraft and manpower.

This EA has been prepared by the USAF in compliance with the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4331 et seq.), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500-1508), the Air Force Environmental Impact Assessment Process Regulations at 32 CFR Part 989, and Air Force Instruction (AFI) 32-7061 (Secretary of the Air Force [SecAF] 2003).

The information presented in this document will serve as the basis for deciding whether the Proposed Action would result in a significant impact to the human environment, requiring the preparation of an Environmental Impact Statement (EIS), or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FONSI) would be appropriate. If the execution of any of the Proposed Action would involve "construction" in a wetland as defined in Executive Order (EO) 11990, Protection of Wetlands, or "action" in a floodplain under EO 11988, Floodplain Management, a Finding of No Practicable Alternative (FONPA) would be prepared in conjunction with the FONSI.

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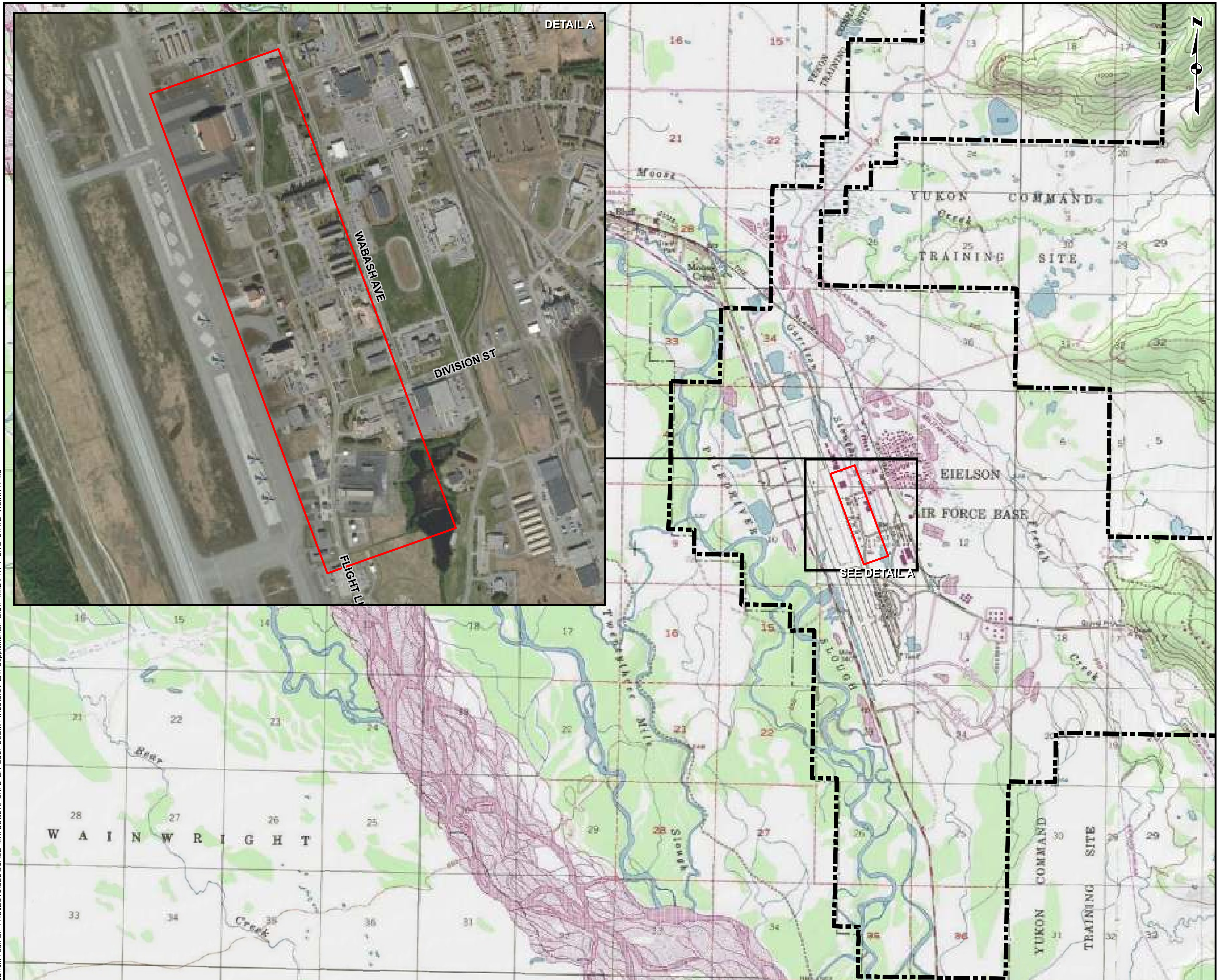
EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

SITE LOCATION AND VICINITY



Legend

Approximate Region of Influence

Installation Boundary

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

ALASKA STATE PLANE ZONE 3. U.S. SURVEY FEET
HORIZONAL DATUM: NAD83(2011) | VERTICAL DATUM: NAVD88

1 0.5 0 1 2
Miles

PROJECT No.: 321004	DATE: 10/19/2022	FIGURE: 1.1-1
P.M.: M.V.	DRAWN: J.C.	

1 INCH

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1.2 Background

The AKANG 168 WG at Eielson AFB is the only Arctic region air refueling unit in the United States. Their squadron of eight tankers transfers more fuel than any other Air National Guard (ANG) tanker wing. The most frequently refueled aircraft are active-duty assets, many on federal operational missions; however, the 168 WG also provides aerial refueling support to military aircraft for training missions and exercises.

The proposed additional aircraft and associated personnel underscore the growing importance of the Arctic. The 168 WG provides the USAF the capabilities of global reach and vigilance through the combined operations of air refueling, missile warning, and space surveillance. The unit maintains a constant watch and commitment for PACAF, Northern and Air Force Space Commands, and the Alaskan North American Aerospace Defense Command Region. Because of Alaska's strategic location regarding national defense, the mission and importance of the 168 WG and the AKANG is anticipated to continue to increase in the coming years.

1.3 Purpose and Need

The purpose of the Proposed Action is to optimize Air Force capabilities throughout the region to support the National Defense Strategy (NDS) by defending the homeland, competing when necessary to maintain favorable regional balances of power, and ensuring common domains remain free and open. Air operations and missions out of Eielson AFB are critical to the success of accomplishing the NDS. Eielson's Airmen have operational experience over the Arctic, a region of increasingly important strategic interest as the polar icecap melts and the region becomes accessible to more nations. An increase in refueling capacity, provided by the 168 WG KC-135 fleet, is necessary to ensure that increasing mission needs in the Arctic are met in support of the NDS.

If this action is not implemented, the existing KC-135s will be unable to adequately support the fighter squadrons during long-range missions over the Pacific Ocean, North Pole, and Joint Pacific Alaska Range Complex (JPARC) regions. Existing KC-135s will be tapped to maximum potential during real-world events, which could result in insufficient refueling coverage and availability for mission needs, potentially leading to mission delays or cancellations, and overall failure to meet the objectives of the NDS.

1.4 Interagency/Intergovernmental Coordination and Consultations

1.4.1 Interagency Coordination and Consultations

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a Proposed Action. Per the requirements of Intergovernmental Cooperation Act of 1968 (42 USC 4231[a]) and EO 12372, Intergovernmental Review of Federal Programs, federal, state, and local agencies with jurisdiction that could be affected by the Proposed Action were notified during the development of this EA.

Appendix A contains the list of agencies consulted during this analysis and copies of correspondence.

1.4.2 Government to Government Consultations

Consistent with the National Historic Preservation Act (NHPA) of 1966 implementing regulations (36 CFR Part 800), U.S. Department of Defense (DoD) Instruction 4710.02, Interactions with Federally Recognized Tribes; AFI 90-2002, Air Force Interaction with Federally Recognized Tribes; and Air Force Manual (AFMAN) 32-7003, Environmental Conservation; the Department of the Air Force (DAF) is also consulting with federally recognized tribes. Those tribes that are historically affiliated with the Eielson AFB geographic region are invited to consult on proposed undertakings that have a potential to affect properties of cultural, historic, or religious significance to the tribes. The tribal coordination process is distinct from NEPA consultation or the Interagency Intergovernmental Coordination for Environmental Planning process and requires separate notification of relevant tribes. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Eielson AFB point-of-contact for Native American tribes is the Installation Commander. The Eielson AFB point-of-contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation (ACHP) is the Cultural Resources Manager.

The Native American tribal governments that will be coordinated with regarding this action are listed in Appendix A. Copies of Government-to-Government consultation letters may also be found in Appendix A.

1.4.3 Other Agency Consultations

The environmental analysis process, in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed Action and alternatives. Further, compliance with Section 7 of the Endangered Species Act (ESA) and Section 106 of the NHPA require consultation with the U.S. Wildlife Service (USFWS) and the State Historic Preservation Office (SHPO), respectively. Federal, state, and local agencies with jurisdiction that could be affected by the alternative actions were notified and consulted during the development of this EA.

Appendix A contains the list of agencies consulted during this analysis and copies of correspondence.

1.5 Public and Agency Review of EA

Because the Proposed Action area coincides with the Federal Emergency Management Agency (FEMA) 100-year floodplain, it is subject to the requirements and objectives of EO 11988. The USAF published early notice that the Proposed Action would occur in a floodplain in the newspaper of record (the Fairbanks Daily News-Miner) on 13 March 2022. The notice identified state and federal regulatory agencies with special expertise that had been contacted and solicited public comment on the Proposed Action and any practicable alternatives. The comment period for public and agency input on these projects ended on 12 April 2022.

A Notice of Availability (NOA) of the Draft EA and FONSI/FONPA was published in the newspaper of record (listed below), the Fairbanks, Alaska Facebook page, and on the Eielson Air Force Base website, announcing the availability of the EA for review on 4 December 2022. The NOA invited the public to review and comment on the Draft EA. The public and agency review period ended on 7 January 2023. The NOA and public and agency comments are provided in Appendix A (to be included in Final EA).

The NOA and early notice of project execution in a floodplain/wetland were published in the Fairbanks Daily News-Miner, Fairbanks, Alaska (AK).

Copies of the Draft EA and FONPA were also made available for review at the following locations:

Noel Wien Public Library 1215 Cowles Street Fairbanks, AK 99701	North Pole Branch Library 656 NPHS Boulevard North Pole, AK 99705	Eielson AFB website https://www.eielson.af.mil/General-Information/Environmental/

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

This EA evaluates the potential environmental impacts that may arise from the addition of up to four KC-135 Stratotanker aircraft and associated approximately 254 supporting active-duty personnel to form an "Active Associate Squadron" at Eielson AFB. The Proposed Action would result in the following changes:

1. An increase in the number of KC-135s stationed at Eielson AFB
2. An increase in the number of KC-135 support personnel
3. An increase in KC-135 operations and maintenance (O&M)
4. Construction, demolition, and facility renovation to support increased personnel and operations

2.1.1 Airframes

The stationing of four additional KC-135s would result in 12 total PAA. The four additional airframes would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The four airframes would be stationed at the installation in phases, with the first aircraft arriving in the 4th Quarter Fiscal Year (FY) 2023 and the last aircraft arriving in the 4th Quarter FY2025.

2.1.2 Personnel

Approximately 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that incoming personnel associated with the Proposed Action would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. Based on Census data, the population of the Fairbanks North Star Borough (FNSB) was 95,655 in 2020 (U.S. Census Bureau [Census] 2021a). The incoming active-duty personnel and their dependents would represent a 0.5% increase in the FNSB population. As of December 2018, the population of Eielson AFB base was 10,756 military and civilian personnel and dependents (MyBaseGuide 2021). The Proposed Action would represent a 4.7% increase in the installation population. Table 2.1-1 presents a summary of the incoming supporting personnel by personnel group/function and rank.

Table 2.1-1 Breakdown of Proposed Incoming Supporting Personnel for KC-135 Beddown

PERSONNEL GROUP/FUNCTION	OFFICER	ENLISTED	CIVILIAN	ACTIVE-DUTY TOTAL
Operations	25	44	-	69
Maintenance	1	125	-	126
Security Forces	-	20	-	20
Base Operations Support	-	27	12	39
Totals	**26**	**216**	**12**	**254**

Notes:
Source: PACAF 2022.

2.1.3 Aircraft Operations

The Proposed Action is estimated to increase the installation's KC-135 annual operations by 200%. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. Aircraft operations would occur within existing airspace and training areas currently used by the existing KC-135 fleet at Eielson AFB. A change in airspace would not be necessary to execute the Proposed Action.

2.1.4 Construction and Demolition

The Proposed Action would have associated construction and demolition projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Tables 2.1-2 and 2.1-3 provide a summary of the new construction and demolition projects, respectively, and Figures 2.1-1 and 2.1-2 show the location of proposed projects falling under the Proposed Action. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF; sum of Table 2.1-2 Total Area of Disturbance, Table 2.1-3 Total Demolition Area, and Table 2.1-4 Total Area of Renovation) and would increase the total impervious surface on the installation by approximately 361,786 SF (sum of Table 2.1-2 and 2.1-4 Change in Impervious Surfaces).

2.1.5 Facility Renovation

The Proposed Action would entail the renovation of six buildings and one de-icer tank to accommodate associated incoming aircraft, personnel, and other equipment. Proposed renovations are summarized in Table 2.1-4 and shown on Figure 2.1-1.

Table 2.1-2 Proposed New Construction Projects

FACILITY	DESCRIPTION	ALTERNATIVES CONSIDERED BUT DISMISSED	AREA OF DISTURBANCE	CHANGE IN IMPERVIOUS SURFACES
Aerospace Ground Equipment (AGE) Warm Storage	Addition of space to accommodate additional AGE requiring warm storage	Existing vehicle storage building inadequate and not suitable for renovation. Alternative locations did not meet siting criteria for proximity to existing facility.	7,500 SF	+ 7,500 SF
9-Bay Vehicle Warm Storage	Specialized vehicle warm storage to accommodate 11 vehicles	Renovation alternative dismissed due to: insufficient depth for size of vehicles; grade of ramp and snow/ice accumulation in front of doors; lack of glycol capture system in the event of vehicle tank failure. Alternative locations did not meet siting criteria.	9,000 SF	+ 9,000 SF
CTK/Maintenance Storage	Meet support requirement for a secure flightline CTK area; enable consolidation of individual shop CTKs, generating space for incoming personnel	Alternative locations did not meet siting criteria for proximity to existing Building 1176 (CTK/Storage) Composite Maintenance Hangar Bay.	4,500 SF	+ 4,500 SF
Maintenance Admin	Support requirement of MXG administrative personnel (+20 seats)	Renovation alternative dismissed due to small and poorly configured space. Alternative locations did not meet siting criteria for proximity to MXG facilities.	4,000 SF	+ 4,000 SF
OG Parking	Parking area to accommodate additional personnel at Squad Operations Building 3129 (+50 stalls)	Alternative locations did not meet siting criteria for proximity to Building 3129.	16,100 SF	+ 16,100 SF

Table 2.1-2 Proposed New Construction Projects

FACILITY	DESCRIPTION	ALTERNATIVES CONSIDERED BUT DISMISSED	AREA OF DISTURBANCE	CHANGE IN IMPERVIOUS SURFACES
Fuel Receipt Tank	New fuel tank and valves with capacity 420k gallons to meet need for increased fuel storage capacity with incoming aircraft	No alternatives considered because project is sited adjacent to existing fuels facility within a designated area for future jet fuel tank expansion.	26,000 SF	+ 26,000 SF
96-Man Dormitory	Dormitory to provide lodging for incoming airmen (+96 personnel)	Alternative locations considered as part of IDP; alternatives did not meet siting criteria for proximity of dormitories to dining facility.	18,500 SF	+ 18,500 SF
96-Man Dormitory Parking	Addition of 72 parking stalls and associated sidewalks	No alternatives considered. Dormitory inhabitants require parking adjacent to the new dormitory.	38,000 SF	+ 38,000 SF
96-Man Dormitory Fire Lane	Asphalt concrete pavement area for the gated Fire Lane	No alternatives considered; required Fire Lane for building.	10,000 SF	+10,000 SF
Maintenance Hangar	58,000 SF hangar to provide needed space for short-term day maintenance. Can house aircraft during winter months. Includes building footprint, apron, POV parking, and paved areas around hangar.	Alternative locations did not meet siting criteria for proximity to Building 1176 to minimize ground handling of aircraft and transit time of maintenance personnel/support equipment.	188,000 SF	+188,000 SF
Total Area			**321,600 SF**	**321,600 SF**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: 168 CES 2022; DAF 2022; Eielson AFB 2021a; NGB 2021; USAF 2021a, 2022a, 2022b, 2022c, 2022d; PACAF 2021, 2022.

Table 2.1-3 Proposed Demolition Projects

FACILITY	DESCRIPTION	ALTERNATIVES CONSIDERED BUT DISMISSED	SIZE OF FACILITY
Bldg 1173 Tug & De-icer Warm Storage	Demolition of building to make space for construction of De-icer Complex	Renovation alternative dismissed due to existing facility's poor siting and obstructions in direction of needed expansion.	7,500 SF
Bldg 1174 Refueling Pump Station	Demolition of building to make space for construction of De-icer Complex	Renovation alternative dismissed due to outdated pumps and USTs in need of replacement.	7,500 SF
Total Demolition Area			**15,000 SF**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: Eielson AFB 2021a; PACAF 2021.

Table 2.1-4 Proposed Renovation Projects

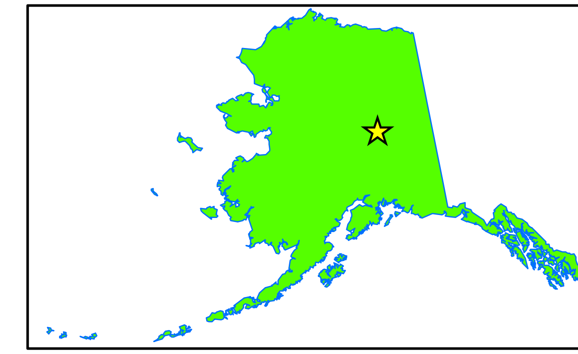
FACILITY	TYPE OF RENOVATION	DESCRIPTION	SIZE OF RENOVATION	CHANGE IN IMPERVIOUS SURFACES
Bldg 1168 Maintenance	Exterior	Addition of space for NDI and corrosion control.	8,500 SF	+ 8,500 SF
Bldg 1171 Fuel Cell Hangar	Exterior	Addition of administration area to accommodate +7 personnel and space to prevent cross-contamination of dirty/clean areas. Single-story addition alternative dismissed due to extensive work and funding requirements; second floor construction alternative dismissed due to impacts on hangar usability.	1,450 SF (+ 5,000 SF construction)	+ 5,000 SF
Bldg 1172 AGE Warm Storage	Exterior	Addition of space to accommodate additional AGE requiring warm storage.	4,686 SF	+ 4,686 SF
Bldg 3129 Squad Ops	Exterior	Addition of operational workspace to accommodate incoming personnel (+53 seats).	15,200 SF	+ 15,200 SF
Bldg 3229 Fuel/Fire Vehicle Maintenance	Exterior	Alteration for the fuel and fire systems maintenance facility; accommodate +6 vehicles and +3 personnel. No alternative locations will meet need.	6,800 SF	6,800SF
De-icer Tank	Replace/Repair	Repair/replace existing de-icer tank that is not operational due to contamination; additional de-icer capacity needed to support incoming aircraft.	N/A	0 SF
Total Area			**41,636 SF**	**40,186 SF**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: Eielson AFB 2021a; NGB 2021; USAF 2021a, 2022e, 2022f; PACAF 2021, 2022.

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT

EIELSON AIR FORCE BASE, ALASKA

PROPOSED CONSTRUCTION, RENOVATION, AND DEMOLITION AT EIELSON AIR FORCE BASE



Legend

- Airfield Fence
- Utilidor
- 168 WG Parcel
- 354 FW Parcel
- Demo
- Building
- New Construction
- Refurbish/Renovation

Abbreviations

AGE	Aerospace Ground Equipment
CTK	Composite Tool Kit
EA	Environmental Assessment
OG	Operations Group

Notes

1. Map produced using ESRI ArcMap v. 10.7.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2021. *KC-135 Beddown & SATAF.* Map prepared by 354 CES/CENPL. September.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET

HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

260 130 0 260 520

SCALE IN FEET

PROJECT No.: 321004	DATE: 4/18/2022	FIGURE: 2.1-1
P.M.: M.V.	DRAWN: C.B.	

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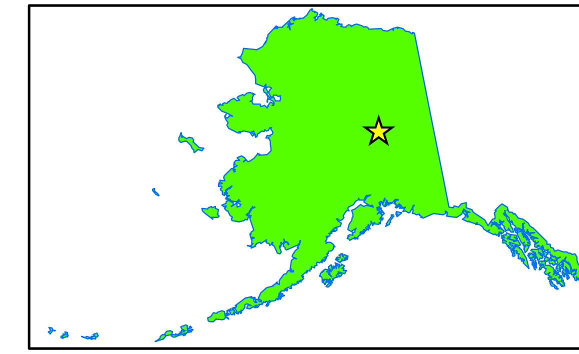
EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

PROPOSED NEW MAINTENANCE HANGAR AND NEW DORM AT EIELSON AIR FORCE BASE



Legend

- Airfield Fence
- Utilidor
- 168 WG Parcel
- 354 FW Parcel
- Building

New Construction

Abbreviations

EA Environmental Assessment

Notes

1. Map produced using ESRI ArcMap v. 10.7.
2. Location and footprint of Options 1 and 2 for New Maintenance Hangar are preliminary, approximate, and based on: 168 WG. 2022. 168th Wing Possible Hangar Locations, For Purpose of Add to EA/DOPAA. March 29.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2021. *KC-135 Beddown & SATAF*. Map prepared by 354 CES/CENPL. September.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONTAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

450 225 0 450 900

SCALE IN FEET

PROJECT No.: 321004	DATE: 4/19/2022	FIGURE: 2.1-2
P.M.: M.V.	DRAWN: C.B.	

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2.2 Selection Standards for Alternatives

The NEPA and CEQ regulations mandate the consideration of reasonable alternatives for the Proposed Action. "Reasonable alternatives," as defined in 40 CFR 1508, means a reasonable range of alternatives that are technically and economically feasible, meet the purpose and need for the Proposed Action, and, where applicable, meet the goals of the applicant. Per the requirements of 32 CFR Part 989, the USAF Environmental Impact Analysis Process (EIAP) regulations, selection standards are used to identify alternatives for meeting the purpose and need for the USAF action.

The DoD desired end-state for the Arctic is a secure and stable region in which U.S. national security interests are safeguarded, the U.S. homeland is defended, and nations work cooperatively to address shared challenges. Protecting U.S. national security interests in the Arctic will require the Joint Force to sustain its competitive military advantages in the Indo-Pacific and Europe, as key regions of strategic competition, and to maintain a credible deterrent for the Arctic region. DoD must be able to quickly identify threats in the Arctic, respond promptly and effectively to those threats, and shape the security environment to mitigate the prospect of those threats in the future.

The 2019 DoD Arctic Strategy outlines strategies in support of the desired Arctic end-state:

1. Building Arctic awareness
2. Enhancing Arctic operations
3. Strengthening the rules-based order in the Arctic

To support the DoD Arctic strategy, the Proposed Action alternatives must meet the following basing selection standards:

1. Currently host KC-135 aircraft so that existing operations, maintenance, and installation manpower are knowledgeable of air refueling support
2. Allow for large force exercises using a multitude of ranges and maneuver areas in the Arctic
3. Provide proximity to available airspace for realistic, world-class training in the Arctic
4. Be based at locations capable of meeting combatant commander requirements, while being accessible to respond to contingencies outlined in the national security strategy

Once basing selection standards are applied and alternatives are selected to carry forward for analysis, separate project selection standards are applied to consider the construction, demolition, and renovation projects associated with the Proposed Action. In addition to the four basing selection standards described above, the Proposed Action alternatives must meet the following two project selection standards:

1. Provide facilities, equipment, supplies, and personnel necessary for maintaining and managing the full spectrum of operations for 12 KC-135 aircraft
2. Allow for continuation of current operational pace

For details on eliminated alternatives for associated projects, refer to the Alternatives Considered but Dismissed in Tables 2.1-2 and 2.1-3.

2.3 Screening of Alternatives

Installations in the Pacific region were considered to receive the four additional KC-135 aircraft through the basing process. The installations were evaluated based on their current operations and proximity to the Arctic Region. Table 2.3-1 presents the installations considered.

Construction, renovation, and demolition projects associated with the Proposed Action at Eielson AFB were screened based on the existing facilities operations, current and future logistics, and current and future safety and security needed.

Table 2.3-1 Pacific Region Installations

INSTALLATION NAME	KC-135 REFUELING UNIT	LOCATION
Eielson AFB	168th WG[1]	Alaska
Joint Base Elmendorf-Richardson	None	Alaska
Andersen AFB	None	Guam
Joint Base Pearl Harbor Hickam	203rd Air Refueling Squadron[1]	Hawaii

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
[1] Source: ANG 2021.

2.4 Detailed Description of Alternatives

The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from23 the public and other agencies will inform decisions made about whether, when, and how to execute the Proposed Action. The No Action Alternative will substantively analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

Action alternatives that met the four basing selection standards described in Section 2.2 were considered reasonable and retained for consideration. Alternatives that did not meet one or more of the basing selection standards were considered unreasonable and are not retained for consideration in the EA.

2.4.1 Preferred Alternative

The proposed addition of four KC-135 aircraft to the Arctic is part of a Tanker force structure move from SecAF and is based on the need for additional aircraft support in the Arctic. Eielson AFB, Alaska was an alternative considered reasonable and retained for consideration as the Preferred Alternative, as it meets the four established basing selection standards:

1. Eielson AFB has existing Arctic Operations and practices large force exercises and maneuvering in the Arctic region.
2. Eielson AFB is centrally located in Alaska and is within Arctic airspace already used for training.
3. Eielson AFB is strategically located to support the U.S. Northern Command and the national security strategy, which prioritizes deterring aggression and preparedness in the Indo-Pacific region.
4. Eielson AFB is currently host to eight KC-135 aircraft and is the only Arctic refueling fleet (168 WG) in existence; consequently, Eielson has the baseline infrastructure and knowledgeable installation manpower to be able to support additional incoming KC-135 aircraft.

Based on the above criteria, Eielson AFB was the only installation determined to be able to reasonably support the demand for increased refueling capacity in the Arctic region. Under the Preferred Alternative, Eielson AFB would receive four additional KC-135 aircraft, increasing the total number of PAA to 12. Eielson AFB would also receive an associated approximately 254 supporting active-duty personnel. The USAF would construct, renovate, or modify at least 12 facilities to accommodate the additional aircraft and manpower. These projects are detailed in Tables 2.1-2, 2.1-3, and 2.1-4 and would provide necessary space for equipment, supplies, and incoming personnel needed to maintain and manage the increased KC-135 operations, thereby ensuring continuity of current operational pace.

2.4.2 Andersen AFB

Under this potential alternative, four KC-135s would be stationed at Andersen AFB, Guam instead of Eielson AFB. Andersen AFB does not currently host KC-135 aircraft and existing infrastructure would be unable to absorb the incoming aircraft and associated supporting active-duty personnel. Extensive new construction would be needed to provide the appropriate support space for a new type of aircraft with different maintenance and operational needs than the aircraft currently onsite. Andersen AFB is approximately 3,000 miles away from the Arctic, and 4,800 miles away from Arctic airspace used for training. The extreme difference in climate between Guam and the Arctic would cause maintenance issues for the aircraft.

2.4.3 Joint Base Pearl Harbor-Hickam

Under this potential alternative, four KC-135s would be stationed at Joint Base Pearl Harbor-Hickam, Hawaii instead of Eielson AFB. This installation currently hosts the 203rd Air Refueling Squadron, which operates KC-135 aircraft. Joint Base Pearl Harbor-Hickam is approximately 2,200 miles away from the Arctic, and 3,100 miles away from Arctic airspace used for training. The extreme difference in climate between Hawaii and the Arctic would cause maintenance issues for the aircraft.

2.4.4 Joint Base Elmendorf-Richardson

Under this potential alternative, four KC-135s would be stationed at Joint Base Elmendorf-Richardson (JBER), Alaska instead of Eielson AFB. JBER does not currently host KC-135 aircraft and existing infrastructure would be unable to absorb the incoming aircraft and associated supporting active-duty personnel. Extensive new construction would be needed to provide the appropriate support space for a new type of aircraft with different maintenance and operational needs than the aircraft currently onsite. JBER is approximately 300 miles away from the Arctic, and 260 miles away from Arctic airspace used for training.

2.4.5 No Action Alternative

Under the No Action Alternative, Eielson AFB would retain the current number of eight KC-135s without any additions to or subtractions from the existing fleet. The associated increase in KC-135 personnel plus their dependents; increase in KC-135 O&M; and facility construction, demolition, and renovation would also not occur. The No Action Alternative does not support the DoD Arctic Strategy by building Arctic awareness, enhancing Arctic operations, and strengthening the rules-based order in the Arctic. The No Action Alternative would not meet the purpose of and need for the Proposed Action, as described in Section 1.3.

2.5 Alternatives Eliminated from Further Consideration

Andersen AFB and Joint Base Pearl Harbor-Hickam were two alternatives eliminated from further consideration because these bases do not meet the requirement for proximity to the Arctic and presence of Arctic Operations, as specified in Basing Selection Standards 2 and 3. Additionally, Andersen AFB does not currently host KC-135 aircraft and, therefore, does not meet Basing Selection Standard 1.

JBER (Alaska) was an alternative eliminated from further consideration because the installation does not currently host KC-135 aircraft and, therefore, does not meet Basing Selection Standard 1. Although the base provides proximity to Arctic airspace, ranges, and maneuver areas, the integration of a KC-135 unit onto an installation without existing KC-135 operations was considered undesirable from a logistics and resources standpoint.

All reasonable alternatives were considered during the development of associated construction, demolition, and renovation projects, to include status quo, addition/alteration, and new construction. For details on eliminated alternatives for associated projects, refer to the Alternatives Considered but Dismissed in Tables 2.1-2 and 2.1-3.

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Scope of the Analysis

In compliance with National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ), and Environmental Impact Analysis Process (32 CFR989) guidelines, this chapter describes the current conditions of the environmental resources, man-made or natural, that would be affected by the Preferred Alternative (Proposed Action) or the No Action Alternative. All potentially relevant resource areas were considered for analysis. Depending on the resource category, the extent of the affected environment/region of influence (ROI) may differ. Unless noted otherwise, the extent of the affected environment/ROI is along the northern flightline area and existing Air National Guard Campus on Eielson AFB (Figures 2.1-1 and 2.1-2).

3.1.1 Cumulative Impacts Analysis

As defined in 40 CFR 1508.7, cumulative impacts on the environment are those that result from the incremental impact of the action and other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time. Several USAF-led projects/actions were identified as relevant for cumulative impacts analysis, as presented in Table 3.1-1. No relevant projects led by other agencies or persons were identified in the ROI.

Table 3.1-1 Past, Present, and Reasonably Foreseeable Projects for Cumulative Impacts Analysis

PROJECT	PROJECT DESCRIPTION	TIMELINE
Multiple actions/ projects	Storage, usage, and spills of PFAS-containing materials, including AFFF, on Eielson AFB have resulted in areas of soil and groundwater contamination, which are under investigation. Stockpiles of contaminated soil from recent construction projects will be treated or disposed. Consequently, the base is underlain by a PFAS contamination plume.	Past activities
F-35A Beddown	Beddown of 2 squadrons of F-35A aircraft at Eielson AFB, up to 54 aircraft. Project will increase base population by 2,765, increase F-35A operations, and include associated construction, renovation, and demolition of facilities.	2020-2022
Micro-reactor Pilot Project	Eielson AFB anticipates receiving a nuclear micro-reactor. The micro-reactor technology for the pilot is expected to produce 1-5 MWt per day that could be used directly as heat or converted to electric power to supplement current installation energy sources.	2027
Consolidate Munitions on Quarry Hill	Eielson AFB anticipates a project to consolidate munitions storage on Quarry Hill and demolish existing and outdated facilities at Engineer Hill, but there is a possibility the facilities to be demolished may be repurposed. New facilities would be constructed to meet AFMAN 91-201 Explosive Safety Standards, reduce transport time, and save facility funds and labor.	2027

Notes:
For definitions, refer to Acronyms and Abbreviations section.
Sources: Eielson AFB 2021m, USAF 2016, SAF/IE 2021b

3.2 Air Installation Compatible Use Zone/Land Use/Noise

3.2.1 Definition of Resource

3.2.1.1 Air Installation Compatible Use Zone

The Air Installation Compatible Use Zone (AICUZ) Program was initially established by the DoD as a direct response to the Noise Control Act of 1972 to promote compatible land use patterns around air installations and decrease effects of noise on public health and welfare. The AICUZ Program also protects DoD airfields from encroachment and incompatible land use while balancing the need for aircraft operations with community concerns (FNSB Joint Land Use Study; U.S. Army Fort Wainwright (FWA), USAF Eielson AFB, FNSB Planning Department 2006).

3.2.1.2 Land Use

Land use includes land ownership, status, and consistency with the land management plans and ordinances in effect. For the base and its adjacent communities, land management plans and zoning regulations determine the type and extent of allowable land use in specific areas to limit conflicting land uses and ensure protection of specially designated or environmentally sensitive areas. Military installations tend to divide land use into operational and support functions. Land use categories could also include special use areas, parks and recreational areas, and communities. Broader land management places less emphasis on ordinances. Areas under the DoD airspace include federal, state, local government, and private lands. These areas in Alaska are managed by federal and state agencies, and Alaska Native Corporations under many of the Military Operating Areas (MOAs)/Air Traffic Control Assigned Airspace.

3.2.1.3 Noise

Sound can be defined as a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable, intrusive, or intense enough to cause hearing damage. Proper noise analysis requires assessing a combination of physical measurements of sound, physical and physiological effects, psycho-acoustic, and socio-acoustic effects. Proper analysis is required because the response of different individuals to similar noise events is diverse and can be influenced by the type of noise, the perceived importance, time of day, type of activity, and the sensitivity of the individual. Noise may also affect wildlife through disruption of nesting, foraging, migration, and other life-cycle activities.

Noise analysis typically evaluates potential changes to existing noise environments that would result from implementing the Proposed Action and alternative. In accordance with Air Force Handbook 32-7084, AICUZ Program Manager's Guide (AFH), 65 A-weighted decibels (dBA) Day-Night Sound Level (DNL) is the noise level below which generally all land uses are compatible with the noise from aircraft operations. Areas below 65 dBA DNL may also experience levels of appreciable noise, depending on training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo because of unit deployments, funding levels, and other factors. Noise metrics are described in Table 3.2-1.

Table 3.2-1 Noise Metrics

NOISE METRIC	ABBREVIATION	DEFINITION
Equivalent Sound Level	Leq	Leq is the average sound level in dB of a given event or period of time.
Onset Rate-Adjusted Monthly Day-Night Sound Level	Ldnmr	The metric used for portraying noise levels for aircraft operations, in special use airspace, and analyzing their impacts.
Day-Night Sound Level	DNL	DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. Noise events between 10 p.m. and 7 a.m. are assessed with a 10-dB penalty when calculating DNL.

Notes:
For definitions, refer to Acronyms and Abbreviations section.

3.2.2 Affected Environment

3.2.2.1 AICUZ

The affected environment for AICUZ analysis is Eielson AFB and the surrounding areas, including Moose Creek, North Pole, Fairbanks, and Salcha. Eielson AFB is located inside the FNSB, approximately 22 miles southeast of Fairbanks and 10 miles southeast of North Pole. Moose Creek and Salcha are adjacent to the northern and southern base boundaries, respectively. The FNSB is spread over an area of 7000 square miles. The State of Alaska owns 68 percent (%) of the land, followed by the federal government (DoD and Bureau of Land Management [BLM]) owning 19%, and the remaining 13% under private ownership (FNSB 2018).

Eielson AFB conducted its first AICUZ study in 1978 with updates in 1992 and 1996. The purpose of the study was to examine the effect of noise associated with flight operations at the airfield and recommend land use for areas exposed to noise and accident risk. Noise is further discussed in Section 3.2.2.3. The AICUZ study also provided Accident Potential Zones (APZs) around the Eielson AFB as a planning tool for local land use agencies and the DoD for future land use projects. As presented in Table 3.2-2, the APZs are categorized into three main zones and are based on the landing and takeoff patterns of the aircraft.

Table 3.2-2 Accident Potential Zone Categories

ZONE CLASSIFICATION	ZONE DESCRIPTION
Clear Zone (CZ)	The area with highest aircraft accident potential usually located at the immediate ends of the runway; at Eielson AFB, measures 3,000 feet wide by 3,000 feet long.
Accident Potential Zone I (APZ I)	The area less critical than a CZ but with still significant potential for accidents; at Eielson AFB, measures 3,000 feet wide by 5,000 feet long.
Accident Potential Zone II (APZ II)	The area least critical and with moderate potential for accidents; at Eielson AFB, measures 3,000 feet wide by 7,000 feet long.

Notes:
Source: FNSB Joint Land Use Study.
For definitions, refer to Acronyms and Abbreviations section.

DoD standards recommend no structures in the Clear Zone, no residential structures in the APZ I and low-density residential use in the APZ II. APZs at Eielson AFB are presented in Figure 3.2-1.

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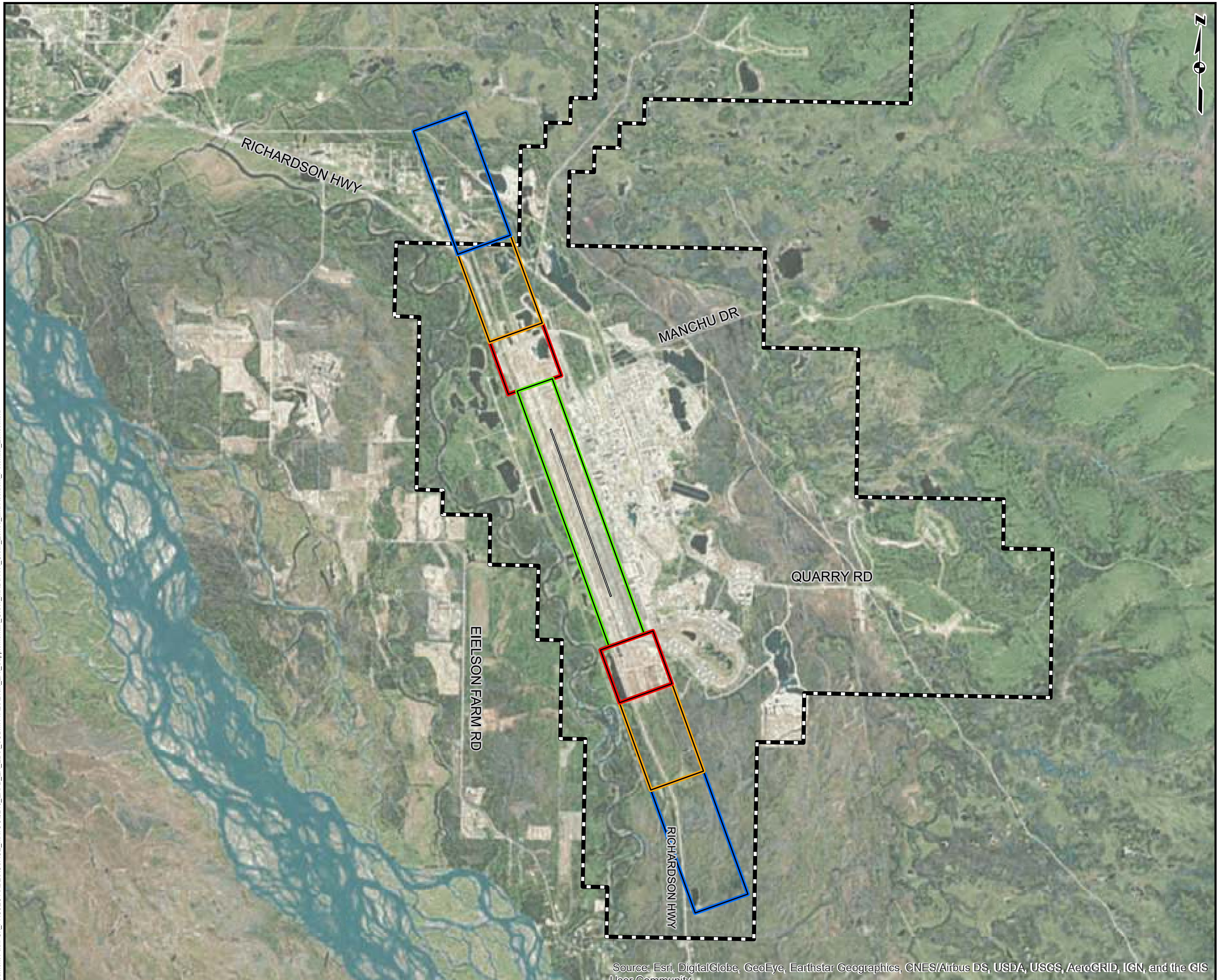

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EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, AK

EIELSON AIR FORCE BASE
CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

Legend
- Eielson Air Force Base Boundary
- Runway 14-32
- Accident Potential Zone 1
- Accident Potential Zone 2
- Clear Zone
- Lateral Clear Zone

Notes
1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References
1. Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 4, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

1 ½ 0 1 2
Miles

PROJECT No.: 321004	DATE: 11/18/2021	FIGURE: 3.2-1
P.M.: M.V.	DRAWN: D.H.	

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3.2.2.2 Land Use

Base

The main base is approximately 19,790 acres. Land management on-base is guided by the Installation Development Plan (IDP). The airfield is the largest portion of the base, with a notably long 14,530-foot runway and associated ramps and taxiways occupying the west and south sides of the base. The runway is parallel to Richardson Highway, which runs through the base. Most aircraft operational and industrial areas are adjacent to the airfield on the east side. Land to the west of the airfield and highway is predominantly undeveloped open space with wetlands, lakes, and forests. The base also includes facilities such as heating, power, water, 910 family housing units, and approximately 615 rooms for unattached military personnel (Eielson AFB 2021b).

Outside of Eielson AFB, land use is guided by the FNSB Regional Comprehensive Plan (FNSB 2005). The purpose of the plan is to protect private property rights and enhance development opportunities, while minimizing land conflicts. Table 3.2-3 presents local community information.

Table 3.2-3 Land Use Near Eielson AFB

NAME OF AREA	LOCATION IN RELATION TO EIELSON AFB	ESTIMATED POPULATION
Moose Creek	North	534
Salcha	South	977
City of North Pole	10 miles Northwest	2,243
City of Fairbanks	22 miles Northwest	32,515

Notes:
Source: Census 2022

Airspace

Any aircraft that operate out of Eielson AFB primarily use the northern Joint Pacific Alaska Range Complex (JPARC) airspace. The northern JPARC airspace includes (but is not limited to) the ranges, training areas, restricted areas, and MOAs associated with Fort Greely, FWA, and Eielson AFB. Delta Junction, a town with an approximate population of 947, is also located under a part of the northern JPARC airspace. Moose Creek and Salcha are unincorporated communities adjacent to Eielson AFB and fall under the JPARC airspace, whereas the incorporated cities of Fairbanks and North Pole lie outside the JPARC airspace. Several other small, unincorporated communities are scattered under the JPARC airspace.

3.2.2.3 Noise

Base

The noise environment at Eielson AFB is comprised of military aircraft sound including F-16C/D, KC-135R, F-35A, and HH-60s and other types of transient aircraft. Figure 3.2-2 shows the noise contour map for Eielson AFB as of October 2020. As identified in the noise map, contours of greater than or equal to 70 dBA lie within the installation boundaries. However, the contour lines for 65 dBA extend 1 mile past the northern base boundary. Table 3.2-4 summarizes the noise impacts within the 65 dBA noise contour.

Because of the operational maneuvers, the period of the day in which they occur, and their single event sound level, departures of F-16 and F-35A based at Eielson AFB contribute the highest DNL north of the base. Transient heavy cargo aircraft and F-35A arrivals contribute the highest DNL to the south of the base (USAF 2016).

Table 3.2-4 Noise Impacts On- and Off-Eielson AFB

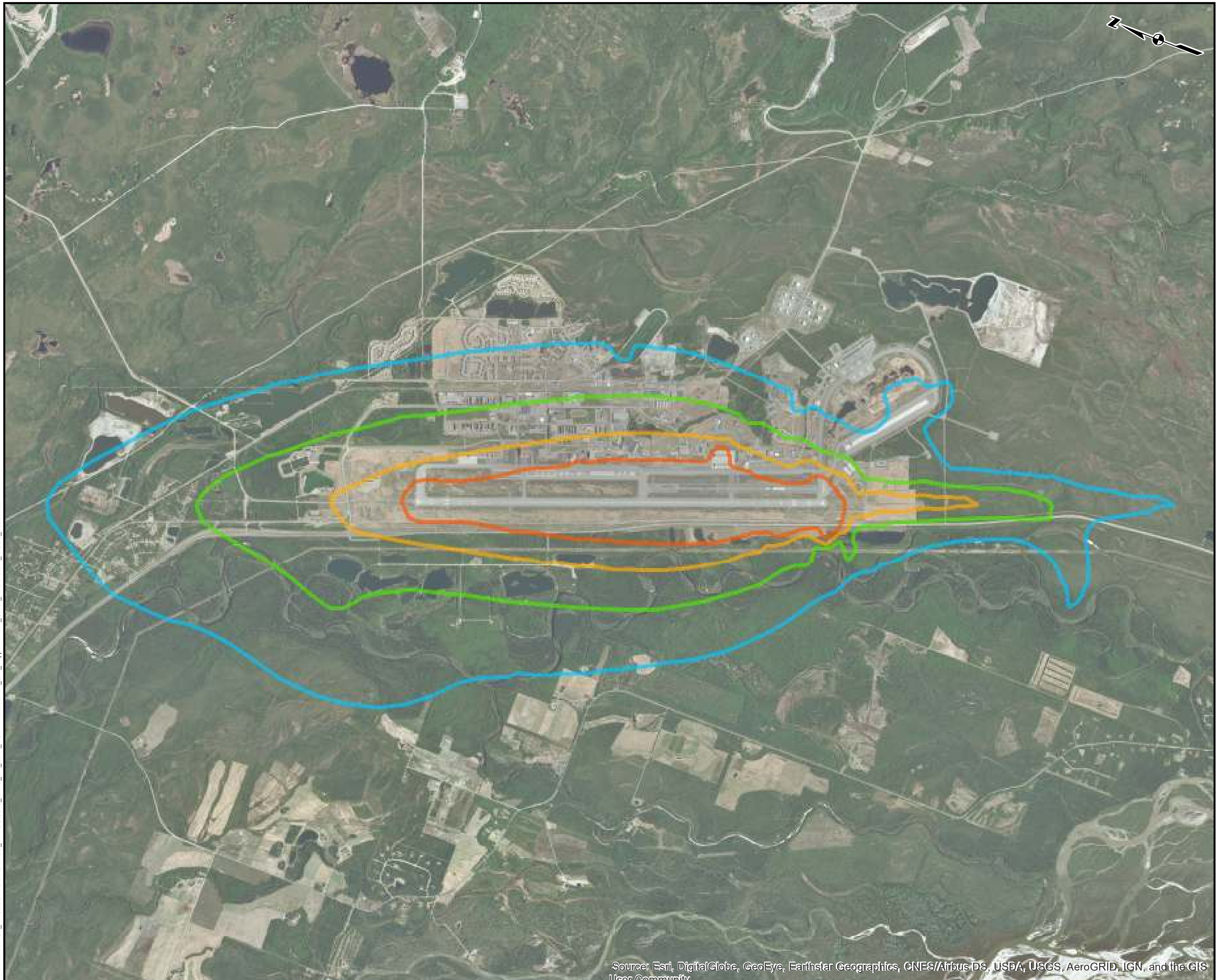
NOISE BAND (DBA)	ACREAGE	ESTIMATED POPULATION	HOUSEHOLDS
On Eielson AFB			
65-70	2,831	2,242[1]	512
70-75	1,761	0	0
75-80	772	0	0
80-85	370	0	0
85+	440	0	0
Total	6,174	2,242	512
Off Eielson AFB			
65-70	884	181[2]	74
70-75	10	0	0
75-80	0	0	0
80-85	0	0	0
85+	0	0	0
Total	**894**	**181**	**74**

Notes:
[1] Population residing within the on-base residences
[2] Population residing in households outside the north boundary of the base
Source: USAF 2016; Census 2021a, 2021b; Alaska Department of Labor and Workforce Development [ADOLWD] 2021a
For definitions, refer to Acronyms and Abbreviations section.

1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

NOISE CONTOUR MAP FOR EIELSON AIR FORCE BASE



Abbreviations

dBA A-weighted decibels

Legend

dBA Day-Night Level

- 65-70
- 70-75
- 75-80
- 80-85

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 4, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

3,500 1,750 0 3,500 7,000
SCALE IN FEET

PROJECT No.: 321004	DATE: 5/12/2022	FIGURE: 3.2-2
P.M.: M.V.	DRAWN: T.A.	

Document Path: G:_PROJECTS\BES\USACE_MATOC\3210_EAFB_EA_EBS_SUBMITTALS\Draft_EA_Supplemental_GIS\1_MXD\F3.2-1_AICUZ_2020.mxd

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Currently, only 5 noise-sensitive locations within and near Eielson AFB experience DNL greater than or equal to 65 dBA. These include Eielson AFB Housing, Ben Eielson Junior/Senior High School, Anderson-Crawford Elementary School, Base Dormitories, and the Moose Creek Baptist Church. Seventy-four households located near the installation are also within the 65 to 70 dBA noise contours.

Airspace

The JPARC airspace is the affected environment for the Proposed Action's noise impacts. Most supersonic flights in the northern JPARC airspace consist of F-22s based at JBER, F-16s and F-35s based at Eielson AFB, and transient F-15 and F-16 aircraft (JPARC 2013; USAF 2016). The most noise impacts occur during the major flying exercises like the Red Flag-Alaska and the Northern Edge. These exercises typically last 2 weeks and are organized 3 to 4 times a year. JPARC airspace noise modelling was conducted for the JPARC EIS in 2013 and updated for the F-35A Pacific Operational Beddown EIS (USAF 2016). The DoD uses a modified version of DNL for assessing noise in flight routes, which adjusts for the sudden increase in (or onset of) noise and the sporadic nature of sounds, depicted by the symbol Ldnmr. Table 3.2-5 provides baseline Ldnmr values for Northern JPARC airspace, showing that the modelled airspace units have Ldnmr below 65 dBA except for the restricted airspace units R-2205 and R-2211 (USAF 2016).

Table 3.2-5 Baseline Uniform Distributed Ldnmr in Northern JPARC Airspace

JPARC AIRSPACE UNIT	LDNMR (DBA)
Flight Zone	<45
Tanker 1	<45
Tanker 2	<45
Blair	<45
Delta 1	60
Viper	58
Yukon 2	54
Yukon 3B	45
Yukon 4	50
Yukon 5	<45
Yukon Large	55
Fox 3	<45
Paxon	55
R-2202	65
R-2205	71
R-2211	68

Notes:
For definitions, refer to Acronyms and Abbreviations section.
Source: USAF 2016

3.2.3 Environmental Consequences

Significance indicators for AICUZ, land use, and noise have been defined by USAF as described below.

AICUZ

Land use near air installations that results in uses that concentrate people in a compact area, vertical uses that encroach on air space, that may draw birds/animals near airfields creating a strike hazard for aircrafts, that may interfere with radio frequency, that result in excessive lighting and impair pilot vision, result in smoke, dust, and steam impairing a pilot's vision may be significance indicators in terms of AICUZ impacts.

Land Use

Land use impacts have significance assigned to them based on the land use sensitivity levels in the areas affected by the Proposed Action and their compatibility with the conditions existing in the area. Generally, significance indicators for land use impacts are whether the proposed land use is inconsistent or non-compliant with the existing plans or policies, affects the viability of existing land use, affects the area's continued use or potential occupation, or affects the public health or safety of occupants of the adjacent land use.

Noise

Noise change impacts may be considered significant if they violated any federal, state, local noise ordinances. Substantially increasing areas of incompatible land use outside the Eielson AFB borders would also be a significance indicator. Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels).

3.2.3.1 Proposed Action

AICUZ

Base

Minor, negligible, long-term impacts would be expected to AICUZ. The addition of four KC-135 airframes results in a 4.7% increase in the installation's 85 total aircraft, which would increase total KC-135 flight hours from Eielson AFB by 200%, from 1,300 to 3,900. This would not result in changes to the existing APZ with 72 residences remaining within APZ II in Moose Creek. Pilots would be trained to follow established course rules and flight procedures to avoid negative impacts on safety on and nearby the installation.

New facility construction for the Proposed Action would occur on available land and would not change existing APZs. Construction would be guided by DoD Instruction 4165.57 and the IDP to ensure compatible land use on and off-base. Eielson AFB would continue to update its AICUZ plan and work with FNSB to minimize the impacts of the Proposed Action on the land uses surrounding the air installation.

Airspace

The increased KC-135 operations would not change existing APZs or Clear Zones. The additional airframes would use the same airspace and operational patterns as the current Eielson AFB KC-135 airframes, and the JPARC would retain substantial capacity for additional aircraft operations (USAF 2013, 2016). Pilots would be trained to follow airfield course rules and flight procedures to avoid adverse impacts.

Land Use

Base

The addition of four KC-135 airframes and 254 Active-Duty personnel would not significantly impact land use at Eielson AFB. Construction, demolition, and renovation projects (Tables 2.1-2, 2.1-3, 2.1-4) would be consistent with constraint areas and land use guidelines dictated by the IDP. New facilities and incoming aircraft operations would be consistent with the existing military base land use. At the time of the 2006 FNSB Joint Land Use Study, land use conflicts near Eielson AFB were generally limited. USAF would continue to work with FNSB and FWA to plan for land use that would reduce its operational impacts on adjacent private land.

Potential short-term, minor to moderate, beneficial impacts on land use could occur. New facilities would be an efficient use of land and would not conflict with existing uses. Demolition of outdated, underused facilities to create space for new construction would have long-term, minor, beneficial impacts. Facility renovation would have long term, negligible to minor, beneficial impacts on land use by consolidating like functions and increasing land use efficiencies.

Airspace

No impacts are expected to land use within JPARC airspace; the incoming KC-135 airframes would continue using established training areas and flight patterns. The communities of Delta Junction, Moose Creek, and Salcha would remain beneath JPARC airspace, and Fairbanks and North Pole would remain outside JPARC airspace.

Noise

Base

Adverse impacts expected on the noise environment would be short- and long-term. Construction equipment noise would generate short-term, adverse impacts. Table 3.2-6 provides construction equipment noise levels. The following equation is used to determine construction noise levels that would attenuate to ambient sound level (WSDOT 2020):

$$D = D0 * 10\ ((\text{Construction Noise} - \text{Ambient Sound Level in dBA})/\alpha)$$

Where: D = The distance from the noise source
D0 = The reference measurement distance (50 feet is the standard)
$\alpha = 10$

Noise from internal combustion engine-powered construction equipment ranges from 65 dBA to 100 dBA. Based on the above equations, the construction equipment noise would typically travel 16 miles before attenuating to ambient sound levels. The implementation of best management practices (BMPs) would reduce or avoid potential noise impacts. BMPs would include conducting construction primarily during normal weekday business hours in noise sensitive land use areas and use of properly maintained construction mufflers, including factory installed and aftermarket (if applicable) sound-suppressing equipment such as cowlings, shrouds, and engine covers.

Table 3.2-6 Typical Construction Equipment Noise Levels

EQUIPMENT DESCRIPTION	IMPACT DEVICE?	ACOUSTICAL USAGE FACTOR (%)	SPEC. 721.560 LMAX AT 50 FEET (DBA, SLOW)	ACTUAL MEASURED LMAX AT 50 FEET (DBA, SLOW; SAMPLES AVERAGED)
All Other Equipment > 5 hp	No	50	85	N/A
Auger Drill Rig	No	20	85	84
Backhoe	No	40	80	78
Bar Bender	No	20	80	N/A
Blasting	Yes	N/A	94	N/A
Boring Jack Power Unit	No	50	80	83
Chain Saw	No	20	85	84
Clam Shovel (dropping)	Yes	20	93	87
Compactor (ground)	No	20	80	83
Compressor (air)	No	40	80	78
Crane	No	16	85	81
Dozer	No	40	85	82
Drill Rig Truck	No	20	84	79
Drum Mixer	No	50	80	80
Dump Truck	No	40	84	76
Excavator	No	40	85	81
Flat Bed Truck	No	40	84	74
Front End Loader	No	40	80	79
Generator	No	50	82	81
Generator (greater than 25-kVA, VMS signs)	No	50	70	73
Gradall	No	40	85	83
Grader	No	40	85	N/A
Grapple (on backhoe)	No	40	85	87
Horizontal Boring Hydraulic Jack	No	25	80	82
Impact Pile Driver	Yes	20	95	101
Jackhammer	Yes	20	85	89
Man Lift	No	20	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90
Paver	No	50	85	77
Pickup Truck	No	40	55	75
Pneumatic Tools	No	50	85	85
Pumps	No	50	77	81

Table 3.2-6 Typical Construction Equipment Noise Levels

EQUIPMENT DESCRIPTION	IMPACT DEVICE?	ACOUSTICAL USAGE FACTOR (%)	SPEC. 721.560 LMAX AT 50 FEET (DBA, SLOW)	ACTUAL MEASURED LMAX AT 50 FEET (DBA, SLOW; SAMPLES AVERAGED)
Rock Drill	No	20	85	81
Roller	No	20	85	80
Scraper	No	40	85	84
Sheers (on backhoe)	No	40	85	96
Soil Mix Drill Rig	No	50	80	N/A
Tractor	No	40	84	N/A
Ventilation Fan	No	100	85	79
Vibratory Pile Driver	No	20	95	101
Warning Horn	No	5	85	83
Welder/Torch	No	40	73	74

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
SPEC. 721.560 - Construction Noise Control Specification 721.560
Source: Knauer and Soren 2006

The increase in aircraft operations would generate long-term, adverse impacts. Table 3.2-7 provides sound exposure levels (SEL) for arriving and departing aircraft based at Eielson AFB. The single event SEL from arriving F-35s and transient C-5As would remain the highest noise impacts from Runway 14 toward the south of the base. The single event SEL from departing F-16s would remain the highest noise impacts from Runway 32 toward the north of the base. Consequently, noise impacts from additional KC-135 airframes would result in minor, long-term, adverse effects.

Table 3.2-7 Sound Exposure Level for Departing and Arriving Aircraft at Eielson AFB

AIRFRAME	DEPARTING SEL (DBA)	ARRIVING SEL (DBA)
F-35A	87	100
F-16C	103	85
KC-135	86	87
F-22	96	98
F-15E	96	89
C-5A	-	108

Notes:
For definitions, refer to Acronyms and Abbreviations section.
Source: USAF 2016

Airspace

The additional KC-135 aircraft would have minor, negligible, long-term adverse impacts on the noise environment. The F-35As based at Eielson AFB would continue to cause the highest single event noise levels (USAF 2016). The additional KC-135 airframes would continue to use the same existing airspace as the current KC-135 airframes, resulting in no change to the existing noise contours. No areas, residential or otherwise, would be exposed to increases in long-term noise levels. Changes to the noise environment due to the increase in KC-135 operations would be less than a barely perceptible increase in noise when compared to existing conditions. The proposed additional KC-135 aircraft would comply with Eielson AFB noise abatement procedures, using the arrival and departure patterns routed to avoid noise-sensitive areas. Table 3.2-8 provides L_{max} values for the Eielson AFB F-35 and KC-135 airframes.

Table 3.2-8 Maximum Instantaneous A-weighted Sound Level (L_{max}) for F-35 and KC-135 Airframes

		F-35	KC-135
Speed in knots:		400	300
Power Setting:		75% Engine Thrust Request (ETR)	89.6% Maximum Fan Speed (NF)
Overflight Altitude (ft AGL)	500	115	94
	1,000	108	87
	2,000	100	79
	2,500	97	77
	4,000	91	72
	5,000	88	69
	10,000	78	60
	12,500	74	56
	16,000	69	52
	20,000	65	49
	25,000	60	44

Notes:
For definitions, refer to Acronyms and Abbreviations section.
Source: USAF 2016

3.2.3.2 No Action Alternative

AICUZ

Under the No Action Alternative, AICUZ impacts would remain unchanged. There would be no land use associated with the additional KC-135 airframes and the 254 personnel. Base operations would likely continue the general trend of expansion and augmentation. Future projects would be evaluated against the current AICUZ plan to avoid incompatible land uses. Eielson AFB would continue to work with the FNSB to provide recommendations and incorporate changes to ensure no adverse effects on public health and safety. Projects would not occur if they would change the APZs and the Clear Zones or increase aircraft mishaps or accidents. Current and future projects would continue to cause minor, negligible, long-term effects on AICUZ.

Land Use

Base

Impacts on land use would be adverse under the No Action Alternative compared to the conditions described in Section 3.2.2.2. There would be no facility construction, demolition, and renovation and there would be no increase in support personnel or aircraft operations associated with the additional KC-135 airframes. No facilities would be consolidated, and old, underused infrastructure would not be demolished. Installation land would not be used to its maximum potential efficiency. The IDP would guide land use for current and future projects to ensure compatible, beneficial land use. If a future project would change land use, Eielson AFB would evaluate the project to ensure compatibility with the existing land use and minimize adverse impacts. Future base developments would result in minor, adverse or beneficial, long-term land use impacts.

Airspace

Until such time that installation operations change (e.g., new permanently assigned airframes that require modifications to airspace), no impacts would be expected to land use within JPARC airspace. Existing aircraft would continue using established training areas and flight patterns. Delta Junction, Moose Creek, and Salcha would remain beneath JPARC airspace, and Fairbanks and North Pole would remain outside JPARC airspace.

Noise

Base

Impacts on noise would not be expected under the No Action Alternative. There would be no facility construction, demolition, and renovation and there would be no increase in support personnel or aircraft operations. Noise would remain unchanged when compared to existing conditions. USAF would evaluate current and future projects to ensure minimal noise impacts. Construction, demolition, or modification projects would be required to implement proper noise abatement procedures to eliminate or reduce noise impacts on residents on- and off- base. BMPs would continue to be implemented. If a future project were to bring additional aircraft to the installation, proper noise analysis and modelling would be conducted to evaluate changes in the noise contours and to minimize the noise impacts. Current and future projects would be expected to have minor, negligible, long-term noise impacts.

Airspace

Until such time that installation operations change (e.g., new airframes with different noise profiles are permanently assigned to Eielson AFB; flying schedule changes), no noise impacts would be expected to occur to JPARC airspace, and noise contours would remain the same. Existing aircraft would continue using established training areas and flight patterns. Aircraft would continue to follow Eielson AFB noise abatement procedures, using the arrival and departure patterns routed to avoid noise-sensitive areas as much as practicable.

3.2.4 Cumulative Impacts

AICUZ

New facility construction would be guided by DoD Instruction 4165.57 and the IDP to ensure compatible land use on and off-base. Eielson AFB would continue to update its AICUZ plan and work with FNSB to minimize potential cumulative impacts on the surrounding land uses by adhering to recommendations in DoD guidance, AICUZ study, and FNSB Comprehensive Regional Plan. Cumulative impacts to AICUZ are not anticipated.

Because no impacts would be expected to the existing JPARC airspace, APZs, or Clear Zones from the Proposed Action, there would be no cumulative impacts.

Land Use

Base

Potential exists for some short-term, minor to moderate, beneficial cumulative impacts on land use. Construction of new facilities from the Proposed Action and future base developments, such as the planned micro-reactor, would result in an efficient use of installation land. Depending on the siting of the micro-reactor and future base development projects, demolition of outdated and underused facilities to create space for new construction would have long-term, minor, and beneficial impact on the land use. Facility renovation would have long term, negligible to minor, beneficial impacts on land use by consolidating like functions and increasing the efficiency of existing land use. Incompatible land use would be avoided by constraining current and future projects to those evaluated against the IDP. Project design would include compatible land use analysis to avoid conflicting land use. With these planned steps, substantial cumulative impacts to land use on-base would not be anticipated.

Airspace

As the Proposed Action would not result in any impacts to land use within JPARC airspace, there would be no cumulative effects expected either.

Noise

Base

Short-term, minor, adverse, cumulative impacts on the noise environment could occur from the Proposed Action and future base developments, such as the planned micro-reactor, if construction projects were to overlap in timing of execution. Noise impacts would be generated from operation of heavy equipment and tools for construction, demolition, and renovation projects. These impacts would be resolved by ensuring proper noise protection and mitigation to avoid human exposure to noise levels beyond 65 dBA for long durations. This can be achieved using various sound damping systems, scheduling/administrative controls, and proper noise modelling. With these steps implemented, substantial cumulative impacts to noise on-base would not be anticipated.

Airspace

Changes to the types of aircraft operating out of Eielson AFB, airspace used, and frequency of flights would be the factors that could result in impacts to the airspace noise environment for the areas on and off the installation. As the Proposed Action would not be anticipated to affect the 65 dBA noise contours, there would be no cumulative impacts expected to this resource.

3.3 Air Quality

3.3.1 Definition of Resource

Air quality is defined by ambient air concentrations of specific pollutants determined by the U.S. Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the public. Six major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), total suspended particulate matter less than or equal to 10 (PM_{10}) and 2.5 ($PM_{2.5}$) micrometers in aerodynamic diameter, and lead (Pb). Air pollution is the presence of these criteria pollutants in excess of USEPA standards. If air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area; areas that do not meet the national standard are called nonattainment areas (USEPA 2021d). If an area was previously in nonattainment but now meets the standard, it is called a maintenance area. Maintenance areas must have an approved maintenance plan to meet and maintain air quality standards. Table 3.3-1 provides the National Ambient Air Quality Standards (NAAQS) for the pollutants.

Table 3.3-1 National Ambient Air Quality Standards

POLLUTANT		PRIMARY/SECONDARY	AVERAGING TIME	LEVEL
Carbon Monoxide (CO)		Primary	8-hour	9 ppm (10 mg/m^3)
			1-hour	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)		Primary	1-hour	100 ppb (188 µg/m^3)
			Annual	53 ppb (100 µg/m^3)
Ozone (O_3)		Primary and Secondary	8-hour	0.075 ppm (147 µg/m^3)
Particulate Pollution	$PM_{2.5}$	Primary	Annual	12 µg/m^3
		Secondary	Annual	15 µg/m^3
		Primary and Secondary	24-hour	35 µg/m^3
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3
Sulfur Dioxide (SO_2)		Primary	1-hour	75 ppb (105 µg/m^3)
		Secondary	1-hour	0.5 ppm (1,300 µg/m^3)
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USEPA 2015a

3.3.2 Affected Environment

The affected environment for air quality includes the area surrounding Eielson AFB and the adjacent FNSB air district. The FNSB air district includes the urbanized areas of Fairbanks, Chena, Ester, Fox, and North Pole. The boundary ends northwest of Moose Creek. The FNSB air district is in non-attainment for $PM_{2.5}$ (Figure 3.3-1) and in maintenance for CO (Figure 3.3-2). The affected environment for airspace emissions, generated by aircraft operating 3,000 feet and below, includes the area underlying northern JPARC airspace. The baseline emissions for the FNSB air district are shown in Table 3.3-2.

Table 3.3-2 Baseline Emissions for Fairbanks North Star Borough

CRITERIA POLLUTANTS IN TONS PER YEAR					
CO	**NO_x**	**VOCs**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
341,835	9,821	77,608	5,045	42,076	27,529
GREENHOUSE GASES IN METRIC TONS PER YEAR					
CO_2	**CH_4**	**N_2O**	**CO_2e**		
3,348,627	14,928	28	3,384,024		

Notes:
For definitions, refer to Acronyms and Abbreviations section.
Source: USEPA 2011

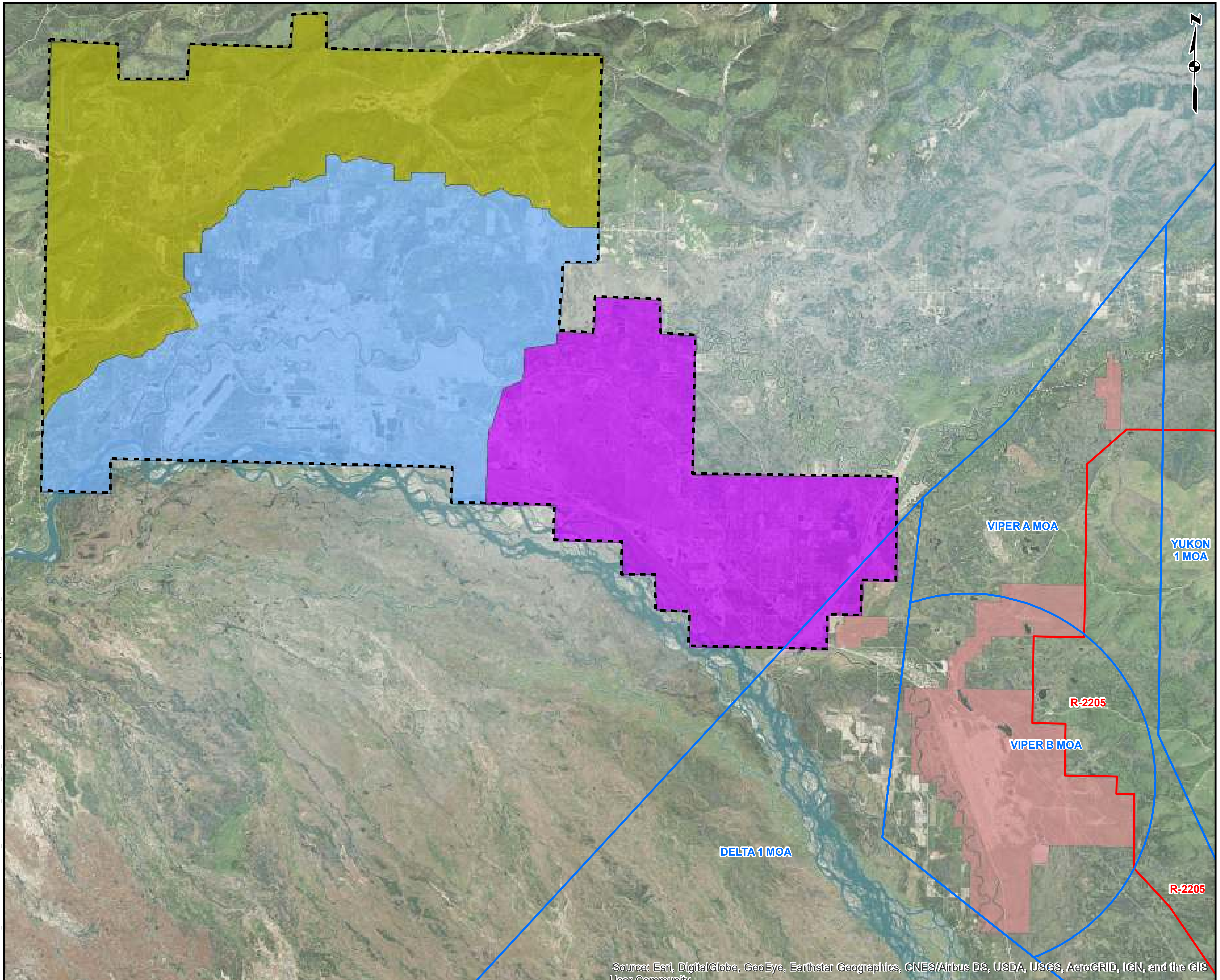
Eielson AFB operates under a Title V air quality operating permit (Permit AQ0264TVP02; ADEC 2013a, 2013b). The base is located outside of the FNSB non-attainment and maintenance areas. Aircraft operations out of Eielson AFB primarily occur within the northern JPARC airspace, which is located inside areas of attainment for criteria pollutants except $PM_{2.5}$; the total area encompassed by the FNSB $PM_{2.5}$ non-attainment area is approximately 487 square miles, 2.78 square miles of which overlap with JPARC airspace (Figure 3.3-1).

Vehicle emissions on Eielson AFB include privately-owned vehicles; light-duty gasoline trucks (0 to 8,500 pounds gross vehicle weight rating [GVWR]); light-duty diesel trucks (0 to 8,500 pounds GVWR); and heavy-duty diesel vehicles (8,501 to >60,000 pounds GVWR).

1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

FAIRBANKS NORTH STAR BOROUGH PM2.5 NON-ATTAINMENT AREA



Legend

- FNSB PM2.5 Nonattainment Area
- Fairbanks Portion of AQCZ
- Goldstream Portion of AQCZ
- North Pole Portion of AQCZ
- Eielson Air Force Base
- Special Use Air Space
- Restricted Airspace

Abbreviations

PM2.5	Particulate Matter 2.5
AQCZ	Air Quality Control Zone

Notes

1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References

1. Fairbanks North Star Borough Air Quality Office. 2017. https://www.fnsb.gov/338/Program-Boundaries. 20 October.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 4, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

15,000 7,500 0 15,000 30,000
SCALE IN FEET

PROJECT No.: 321004	DATE: 8/24/2022	FIGURE: 3.3-1
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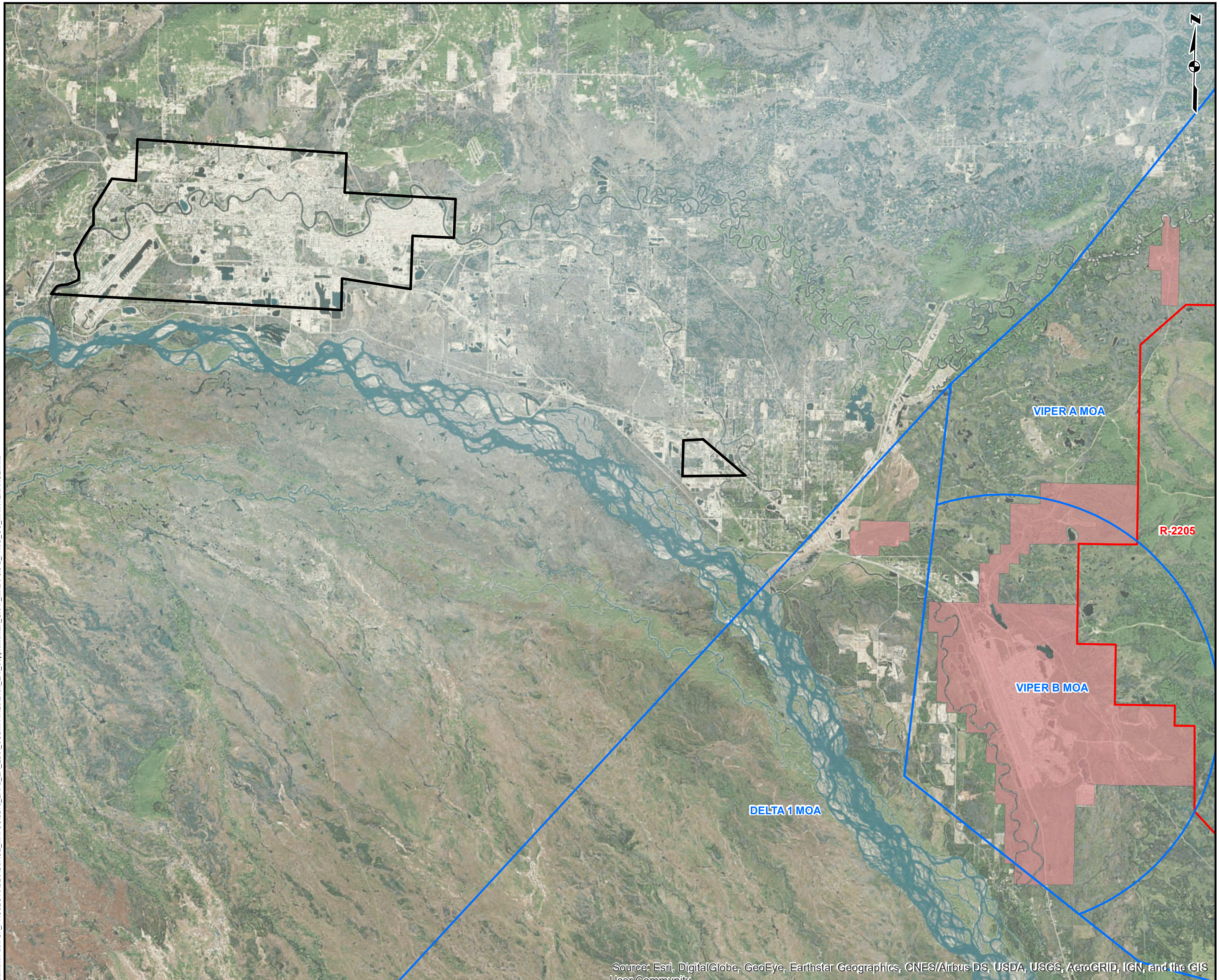

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

FAIRBANKS NORTH STAR BOROUGH CARBON MONOXIDE MAINTENANCE AREA

Legend

- Special Use Air Space
- Restricted Airspace
- Carbon Monoxide Maintenance Area
- Eielson Air Force Base

Notes

1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References

1. Fairbanks North Star Borough Air Quality Office. 2017. https://www.fnsb.gov/338/Program-Boundaries. 20 October.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 4, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

13,000 6,500 0 13,000 26,000
SCALE IN FEET

PROJECT No.: 321004	DATE: 8/24/2022	FIGURE:
P.M.: M.V.	DRAWN: D.H.	3.3-2

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3.3.3 Environmental Consequences

The USAF has defined significance indicators for air quality impacts as whether an action would interfere with the state's ability to maintain the NAAQS, or result in a violation of any federal, state, or local air regulation.

3.3.3.1 Proposed Action

The Proposed Action would have short- and long-term minor adverse impacts on air quality. Airborne dust and other pollutants generated during construction, demolition, and renovation projects would cause short-term emissions increases. The increase in aircraft operations and mobile sources would cause long-term emissions increases. The Air Force has developed an automated screening tool known as the Air Conformity Applicability Model (ACAM) to perform a simplified General Conformity Rule Applicability Analysis for non-transportation proposed actions and projects. Appendix B presents the detailed report for the ACAM Analysis conducted for the Proposed Action, which concludes that increases in emissions would be below the general conformity rule de minimis thresholds and would occur in areas within attainment for all pollutants, except for $PM_{2.5}$. The overlap with JPARC airspace accounts for 0.5% of the total $PM_{2.5}$ non-attainment area, and the general conformity rule would not apply.

3.3.3.2 No Action Alternative

There would be no change in the baseline emissions for the No Action Alternative and consequently no impacts on air quality. The base would operate under the Title V operating permit allowances, resulting in no significant adverse effects. New development at Eielson AFB would continue regardless of the No Action Alternative. Construction of additional facilities and influx of personnel and residents would increase Central Heat & Power Plant (CH&PP) emissions due to increase in power and heat demand. Vehicles and equipment used for new development projects would increase emissions. However, Eielson AFB would continue to ensure compliance with the air quality permits and state and federal air quality laws and would consult with USACE to deploy mitigation measures. Therefore, no significant cumulative impacts are expected.

3.3.4 Cumulative Impacts

The Proposed Action and related projects could result in short- and long-term, minor and major, adverse cumulative impacts on air quality. Present and future projects would occur within the FNSB air district, which has a $PM_{2.5}$ non-attainment area, and CO maintenance area; this could result in deterioration of air quality. Eielson AFB would comply with the CAA and evaluate projects to show compliance with the ADEC Title V Operating Permit. Any exceedances in the permitted limits of criteria pollutants would require mitigation measures to prevent violations. If all measures are followed, then no significant cumulative impacts would be expected.

3.4 Water Resources

3.4.1 Definition of Resource

Water resources are surface waters and groundwater that provide drinking water and support recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems (USEPA 2021a). Surface water, groundwater, floodplains, and wetlands do not function as separate components of the watershed, but rather as a single, integrated natural system. Disruption of any one part can affect the entire system.

Waters of the United States (WOTUS), as defined in 40 CFR 120.2 and 33 CFR 328.3, include navigable waters, tributaries of such waters, non-navigable interstate waters and their tributaries, non-navigable intrastate waters whose use or misuse could affect interstate commerce, and freshwater wetlands "adjacent" to other jurisdictional waters.

The Fish and Wildlife Coordination Act (FWCA) of the United States (16 USC 661-667e) was enacted on 10 March 1934 to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The FWCA provides the basic authority for the U.S. Fish and Wildlife Service (USFWS) to evaluate impacts to fish and wildlife from proposed water resource development projects. Water resources relevant to Eielson AFB include wetlands, floodplains, surface waters, and groundwater.

3.4.1.1 Wetlands

Wetlands are an important natural system and habitat because of their diverse biologic and hydrologic functions, including water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection. Wetlands are a special category of WOTUS and are subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990. Under the CWA, "wetlands" are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3).

3.4.1.2 Floodplains

EO 11988 defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, including at a minimum, that area subject to a 1% chance of flooding in any given year." Areas subject to a 1% chance of annual flooding are called 100-year floodplains, and areas subject to a 0.2% chance of annual flooding are called 500-year floodplains. EO 11988 directs federal agencies to avoid actions in floodplains unless the agency determines that no practicable alternative exists. Where the only practicable alternative is to site in a floodplain, the agency should develop measures to reduce impacts and mitigate unavoidable impacts.

Additionally, EO 11988 directs federal agencies to comply with the National Flood Insurance Program (NFIP). The FNSB participates in the NFIP (Community ID 025009) and has established floodplain management regulations in Title 15, Chapter 4 of the Borough Code, which regulates development within a special flood hazard area (SFHA) by establishing methods, practices, and construction standards for minimizing flood damage. An SFHA is established as lands and properties within the FNSB that are designated as any "A" Flood Zone, including but not limited to Flood Zones A, AE, AH and AO. As per AFMAN 32-7003 paragraph 3.23, USAF will make informed decisions concerning the environmental impacts of infrastructure projects and ensure that development occurs in an environmentally sensitive manner. USAF follows the Federal Building Codes requirements within 41 CFR 102-76.10(c), which state that "Federal agencies, upon approval from the General Services Administration…follow nationally recognized model building codes and other applicable nationally recognized codes that govern Federal construction to the maximum extent feasible and consider local code requirements (see 40 USC 3310 and 3312)." As such, federal projects follow local construction codes to the maximum extent practicable.

3.4.1.3 Surface Waters

Surface waters include natural, modified, and constructed water confinement and conveyance features above groundwater that may or may not have a defined channel and discernable water flows. Stormwater is surface water generated by precipitation events that may percolate into permeable surficial sediments or flow across the top of impervious or saturated surficial areas, a condition known as runoff. Stormwater is an important component of surface water systems because of its potential to introduce sediments and other contaminants. Stormwater flows, which can be exacerbated by high proportions of impervious surfaces are important to surface water management.

National Pollutant Discharge Elimination System

Through the National Pollutant Discharge Elimination System (NPDES), the CWA establishes federal limits on the discharge of specific pollutants to surface waters. Section 401 of the CWA requires state certification for a NPDES permit; in Alaska this is called an Alaska Pollutant Discharge Elimination System (APDES) permit. The APDES stormwater program requires facility operators and owners with stormwater discharges to obtain a Multi-Sector General Permit (MSGP). In addition, construction site operators disturbing 1 acre or more are required to obtain a Construction General Permit for stormwater discharges. The permit mandates use of BMPs to ensure that the facility's operations and soil disturbed during construction do not pollute nearby water bodies. Operators must prepare a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction and facility operations.

United Facilities Criteria (UFC) 3-210-10, Low Impact Development

The UFC system provides planning, design, construction, sustainment, restoration, and modernization criteria to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with the Under Secretary of Defense Acquisition, Technology and Logistics [USD(AT&L)] Memorandum Department of Defense Unified Facilities Criteria, dated 29 May 2002.

Section 438 of the Energy Independence and Security Act (EISA) and the Deputy Under Secretary of Defense DoD policy on implementation of stormwater requirements under EISA Section 438 apply to federal projects with a footprint greater than 5,000 SF. UFC 3-210-10 provides technical criteria, technical requirements, and references for the planning and design of applicable DoD projects to comply with EISA Section 438 stormwater requirements. Low impact Development (LID) is a stormwater management strategy designed to maintain site hydrology and mitigate the adverse impacts of stormwater runoff and nonpoint source pollution. LID seeks to restore pre-development surface water infiltration rates at project sites through one or more LID Integrated Management Practices (IMPs) and design techniques that, to the maximum extent feasible, infiltrate, store, and evaporate runoff close to its source of origin. Examples of LID-compliant design techniques are bio-retention areas and permeable pavements.

3.4.1.4 Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The Safe Drinking Water Act (SDWA; 40 CFR 141) prohibits federal agencies from funding actions that would contaminate a USEPA-designated sole source aquifer or its recharge area. Groundwater can typically be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

3.4.1.5 Wild and Scenic Rivers

In 1968, the Wild and Scenic Rivers Act (WSA; Public Law 90-542; 16 USC 1271 et seq.) established the National Wild and Scenic Rivers System (National System) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The WSA is notable for safeguarding the special character of Wild and Scenic Rivers, while also recognizing the potential for their appropriate use and development (National System 2022a). The four federal agencies charged with safeguarding the National System (the "river-administering agencies") are the BLM, National Park Service (NPS), USFWS, and U.S. Forest Service (USFS).

Section 3 of the WSA designates Wild and Scenic Rivers as those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values (typically interpreted as the WSR's "outstandingly remarkable values" [ORVs]) and free flow. ORVs include features individual to a given river that are unique, rare, or exemplary (e.g., geologic features that occur in a limited area or a particularly well-preserved prehistoric site) and identified through study by the relevant river-administering agency (Congressional Research Service 2020).

There are two study provisions in the WSA (note that not all rivers studied are found eligible or suitable for designation—many study rivers will not be included in the National System): Section 5(a), through which Congress directs the study of select rivers; and Section 5(d)(1), which directs federal agencies to identify potential additions to the National System through federal agency plans. Additionally, Section 2(a)(ii) authorizes the Secretary of the Interior to include a river already protected by a state river protection program in the National System upon the request of that state's governor.

Section 7(a) of the WSA prohibits federal agencies from assisting in the construction of any "water resources project" that would have a "direct and adverse effect" on a designated river or congressionally authorized study river (USFS 2004). Project proponents are required under WSA Section 7 to consult with the applicable river-administering agency to evaluate the potential effects of a proposed water resources project on free flow, water quality, and ORVs. Although the WSA does not define "water resources project," river-administering agencies have generally interpreted the term to refer to any construction or development that could affect a river's free flow. The U.S. Department of Agriculture (USDA) defines the term in regulation as any "construction of developments which could affect the free-flowing characteristics of a wild and scenic river or study river," such as dams, reservoirs, levee constructions, bank stabilization, channelization, or bridges (USFS 2004; Congressional Research Service 2020).

3.4.2 Affected Environment

3.4.2.1 Wetlands

USACE and USEPA define jurisdictional wetlands as those meeting the three criteria defined in USACE's Wetlands Delineation Manual (USACE 1987) and falling under USACE jurisdiction. These criteria are vegetation, soil, and hydrology. Unless an area has been altered or is a rare natural situation, wetland indicators of all three characteristics must be present during some portion of the growing season for an area to be defined as a wetland.

Approximately 52% of Eielson AFB is wetlands, composed of 9,453 acres of vegetated wetlands and 792 acres of lakes, ponds, and streams (Eielson AFB 2016a). These wetlands are the result of natural processes creating heavily saturated and wet soil conditions, such as permafrost (ground and/or water that has been frozen for at least 2 years and in poor drainage), and precipitation and snowmelt flooding or filling many standing water bodies and depressions in the topography, making conditions favorable for wetland areas to occur. The most commonly observed vegetated wetlands on Eielson AFB are dominated by black spruce (*Picea mariana*). Brush and groundcover vegetation in black spruce wetlands are often comprised of bog rosemary (*Andromeda polifolia*), low bush cranberry (*Vaccinium vitis-idaea*), and thick layers of moss.

Within the ROI, the area with the potential to be either directly or indirectly affected by the Proposed Action is a 198.62-acre study area that encompasses most structures and grounds east of the runway on Eielson AFB (Figure 3.4-1).

On 22 September 2021, Stantec Consulting Services Inc. (Stantec) performed a WOTUS determination in the project vicinity. A second WOTUS determination was performed on 4 August 2022 to include the new hangar and dormitory project areas in the analysis. Stantec collected field data at 12 sites in 2021, and 8 sites in 2022. Field data were collected from locations within the wetland study area with the highest probability to be considered wetlands as determined based on existing National Wetland Inventory (NWI) data and available aerial imagery. Field-verified results are summarized in Table 3.4-1. All waters in the study area are classified as Freshwater Pond, and all wetlands are classified as Emergent (Stantec 2022). Appendix C presents the complete wetlands Preliminary Jurisdictional Determination Report.

Table 3.4-1 Waters Within the Study Area

STATUS	ACRES	PERCENT OF STUDY AREA
Wetlands	0.41	0.2
Waters	7.69	3.9
Uplands	190.52	95.9
Total Study Area	198.62	100.0

Notes:
Source: Stantec 2022.
Refer to Appendix C for complete wetlands Preliminary Jurisdictional Determination Report.

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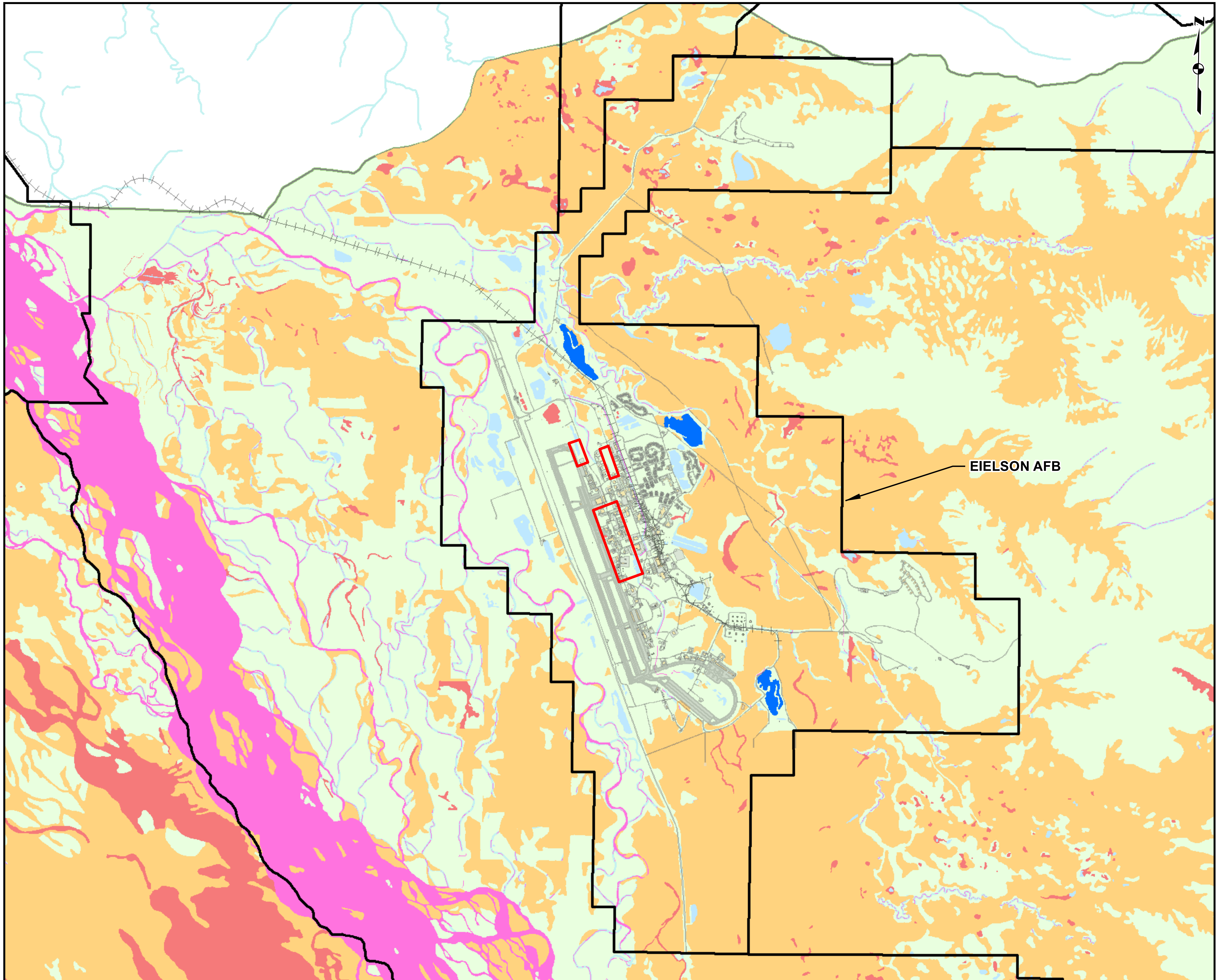
1 INCH



EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

EIELSON AFB WETLANDS AND WOTUS DELINEATION

Legend

- Railroad
- Eielson AFB
- Existing Structures
- Slab
- Pavilion
- Tanks
- Airfield Surface
- Paved Surface
- Vehicle Driveway
- Road Bridge
- Road

USFWS National Wetlands Inventory - Wetlands Within Eielson AFB

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- Watercourse Line
- USFWS National Wetlands Inventory - Tanana Flats - Tanana River Watershed

Wetlands Delineation

- Wetlands Delineation Study Area

Abbreviations

AFB	Air Force Base
USFWS	United States Fish and Wildlife Service
WOTUS	Waters of the U.S.

Notes

1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References

1. Imagery source: Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. Eielson AFB features were sourced from Figure A-2 Eielson Overview – Drainage Basins. *Pacific Air Forces Comprehensive SWPPP, Eielson Air Force Base, Alaska*, December, 2021.
3. Wetlands and watershed layers were sourced from the USFWS National Wetlands Inventory Data.
4. Wetlands delineation study area features were sourced from Figure 4 Waters of the U.S. Delineation. Stantec. Final Preliminary Jurisdictional Determination Report including Technical Amendment. Eielson Air Force Base KC-135 Redistribution Project. September 9, 2022.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

5,800 2,900 0 5,800 11,600
SCALE IN FEET

PROJECT No.: 321004	DATE: 10/19/2022	FIGURE:
P.M.: M.V.	DRAWN: K.T.	3.4-1

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3.4.2.2 Floodplains

The FEMA flood insurance rate map (Figure 3.4-2) for Eielson AFB was used to evaluate impacts to floodplains. This map identifies that approximately 49% of the base (9,296 acres) lies within the 100-year floodplain of the Tanana River (Zone AE) and meets the FEMA definition of an SFHA. The ROI is approximately 168 acres in size; of this, about 19 acres, or 11%, lies within the 100-year floodplain. Outside of the developed portions of the base, the FEMA 100-year floodplain is dominated by a mixture of vegetation types, ranging from white spruce (*Picea glauca*)-hardwood forests west of the Richardson Highway, to black spruce brushfields and wetlands to the east. In the event of a 100-year flood event, these vegetation types would serve to slow the force of floodwaters by trapping or filtering out woody material and silt.

Since its establishment in 1943, the Eielson AFB flightline has never been flooded. Although Fairbanks is downstream of the base, it is the official flood-elevation monitoring site for the Tanana River. The August 1967 Flood of Record for the Tanana River was measured at 27.8 feet. The 2008 flooding of the Salcha and Tanana Rivers caused substantial flooding of the Salcha community to the south (upstream) of Eielson AFB. During this event, a flood level of 26.53 feet was recorded on the Tanana River, 2.03 feet above the flood stage of 24.5 feet recorded at Fairbanks. Neither of these flood events, resulting from unusually heavy summer rains, caused flooding on Eielson AFB (USAF 2016).

3.4.2.3 Surface Waters

Most on-base stormwater flow is overland or sheet flow directed toward Garrison Slough and French Creek. Impervious surfaces comprise approximately 128 acres of the 168-acre ROI (76%). Garrison Slough passes directly through the developed portion of the base and is primarily an engineered drainage channel that drains to Moose Creek. Portions of the slough are enclosed in culverts. Garrison Slough is the only impaired water body located on Eielson AFB. French Creek is located along the eastern boundary of the base. To identify and manage areas where stormwater contamination could occur due to industrial processes, Eielson AFB developed and maintains a base SWPPP, as required under the Alaska Department of Environmental Conservation (ADEC) MSGP (APDES permit number AKR06AD14).

The current SWPPP was completed in 2020, and details Standard Operating Procedures, BMPs, and an assessment of potential discharge contaminants through required discharge sampling and monitoring. Potential stormwater leaving regulated industrial sectors on the installation is contained onsite by structural BMPs or flows into French Creek and Garrison Slough (Eielson AFB 2020a). Eielson AFB also maintains an APDES wastewater discharge permit for their treatment plant operations (permit number 2006DB0045). The wastewater treatment plant (WWTP) permitted capacity is 2 million gallons per day (GPD), while the normal demand is about 600,000 GPD (Eielson AFB 2021p). This permit coverage will expire on 31 March 2025. In addition to the MSGP and wastewater treatment permit, Eielson maintains an APDES permit for the Water Treatment Plant (AKG380017), and the CH&PP (AK0001341). Eielson AFB maintains coverage under these permits and updates the plans and permits as installation operations modifications require per the permit coverage.

To comply with stormwater requirements under EISA Section 438, the USAF would include LID strategies as outlined in UFC 3-210-10. The USAF would employ IMPs such as naturally engineered treatments, especially vegetated swales.

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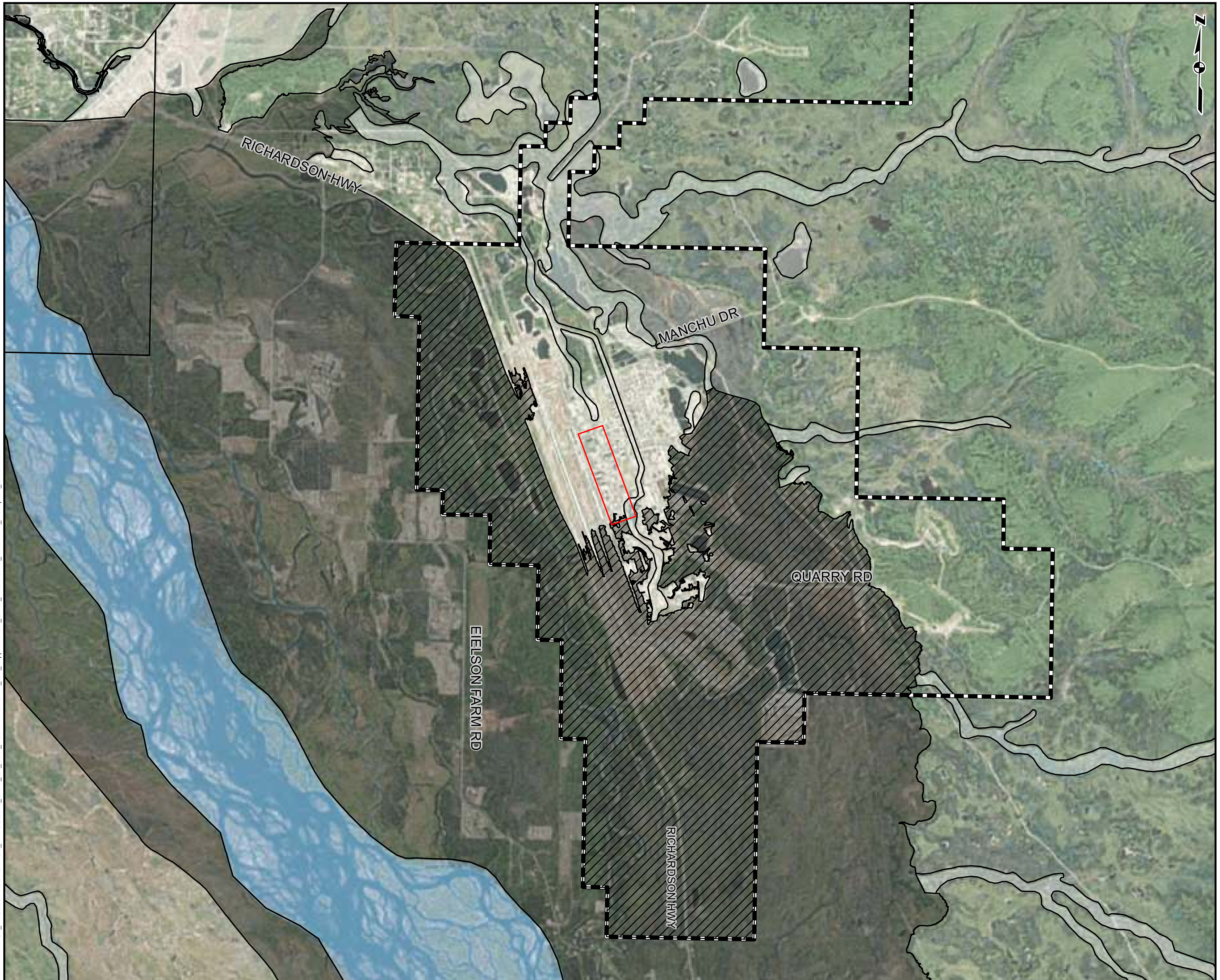

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EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

EIELSON AIR FORCE BASE FLOODPLAIN ZONES

Legend

- Approximate Region of Influence
- Eielson Air Force Base Boundary
- Zone A - No Base Flood Elevations Determined
- Zone AE - Base Flood Elevations Determined
- Floodway Areas in Zone AE
- Zone AE Areas in Base Boundary (9,296 Acres)

Notes

1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References

1. Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. Flood Zones obtained from Federal Emergency Management Agency and displays estimated floodplains (as of July 23, 2021).

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

1 ½ 0 1 2
Miles

PROJECT No.: 321004	DATE: 5/12/2022	FIGURE:
P.M.: M.V.	DRAWN: J.C.	3.4-2

Document Path: G:_PROJECTS\BES\USACE_MATOC3210_EAFB_EA_EBS_SUBMITTALS\Draft_EA_Supplemental_GIS\1_MXD\F3.4-2_Installation_Floodplain_Zones.mxd

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3.4.2.4 Groundwater

Eielson AFB is located in the FNSB, within the Tanana River Valley, which contains an extensive aquifer system. The Tanana Valley Alluvial Aquifer is approximately 50 miles wide and 10 feet below ground surface at its base. It is primarily fed by the Tanana River; the Chena River typically only contributes water when its stage is high and the Tanana River is low. The Tanana River gets approximately 85% of its water from snowmelt of the Alaska Range and 15% from the Yukon-Tanana uplands (Alaska Community Action on Toxics 2003). Due to the presence of snowpack and periods of heavy rainfall, the aquifer's water depth fluctuates seasonally.

Eielson AFB's Public Water System is permitted through a community water system that consists of six sources located on-base near the CH&PP. Groundwater is extracted from the aquifer and is pumped to the installation's water treatment plant 1.3 miles north of the ROI where it is treated, disinfected, and distributed (USAF 2016). The water treatment plant capacity is 2.16 million GPD. The wells can pump 6,500 gallons per minute and the average daily demand is 750,000 to 800,000 GPD, though demand can be higher during periods of heavy rain and spring thaw (USAF 2017; Eielson AFB 2021p). The installation monitors the drinking water quality annually and reports findings to the public through ADEC. In the spring of 2015, the base detected per- and polyfluorinated substances (PFAS) in some wells. Eielson AFB is working with state regulators and local off-base residents to address this issue.

3.4.2.5 Wild and Scenic Rivers

Two interagency Geographic Information Systems (GIS) data sets of Wild and Scenic River centerline data have been made available through the USFS Geospatial Data Discovery Site. A search of this site found no designated Wild and Scenic Rivers on Eielson AFB and five Wild and Scenic Rivers under Northern JPARC Airspace (National System 2022b) (Figure 3.4-3 and Table 3.4-2).

The NPS maintains the Nationwide Rivers Inventory (NRI), a list of more than 3,200 rivers or river segments that appear to meet the minimum WSA eligibility requirements based on free-flowing status and resource values. In accordance with an executive memorandum dated 2 August 1979, each federal agency must "take care to avoid or mitigate adverse effects" to rivers identified in the NRI (NPS 2021). If a river is listed in the NRI, the federal agency involved with the action must consult with the land management agency, or the NPS, if the river is on private lands, to avoid or mitigate adverse effects. This consultation is required pursuant to a directive from the CEQ (USFS 2004). A search of the NRI found no eligible rivers on Eielson AFB and four eligible rivers under Northern JPARC Airspace (NPS 2016) (Figure 3.4-3 and Table 3.4-2).

There are currently three rivers or river systems under active study to identify their potential for addition to the National System—two under Section 5(a) of the Wild and Scenic Rivers Act and one under Section 2(a)(ii). None of these rivers is in Alaska (National System 2022c).

Table 3.4-2 Designated and Eligible Wild and Scenic Rivers in Northern JPARC Airspace

RIVER NAME	RESPONSIBLE AGENCY	REASON	ORVS
Designated Wild and Scenic Rivers			
Birch Creek	BLM	Recreational	Accessible freshwater and whitewater wild river providing a multi-day primitive floating and camping experience which is considered unique.
		Scenic	The changes in topography from a headwater stream to a more mature river with meander bends and braided systems add diversity to a relatively short river segment. The eight-mile stretch of intermittent extruding bedrock with interspersed rapids creates visual contrast with the surrounding vegetation, gravel bars, and water. The range of foreground hills, middle distant mountains, broad flats, and foreground hills as one floats down the river creates a mosaic of backdrops for floaters. The small number of historical cabins that blend with the landscape and are mostly hidden from view add some variety and points of interest to the area. The variety of vegetation types and the seasonal colors are an exemplary example for interior Alaska.
		Fisheries	Birch Creek provides critical habitat for many fish species, making it one of the most diverse watersheds in the region. This diversity makes fisheries an outstanding remarkable value.
Charley River	NPS	Yukon-Charley Rivers National Preserve	The exceptionally clear Charley River is completely contained within Yukon-Charley Rivers National Preserve. The river drops 32 feet/mile in its upper reaches and offers whitewater challenges during high water; during low water flows, it is mild and can be enjoyed by many. Bighorn sheep, caribou, peregrine falcon, moose, and bears may be seen along its banks. This is one of the few rivers designated for its entire length.
Fortymile River	BLM	Cultural & Historic	· The 1886 discovery of gold on Franklin's Bar on the Fortymile River touched off interior Alaska's first gold rush. The mining boom ushered in a wave of settlement that forever changed the place, notably for the native Athabascan Indians who occupied this region. · The military figured prominently in the history of the Fortymile region, as Army troops were sent to the Eagle area in 1899 to address reports of starvation and lawlessness among the miners.
		Fish & Wildlife	The Fortymile River is home to Arctic grayling, round whitefish and burbot. The river corridor provides habitat for caribou, moose, Dall sheep, grizzly and black bear, furbearers, small game, raptors, waterfowl and numerous species of small mammals and birds.
		Recreational	Float trips on the Fortymile River offer scenic beauty, solitude and glimpses of gold-mining dredges, turn-of-the-century trapper cabins and abandoned townsites.

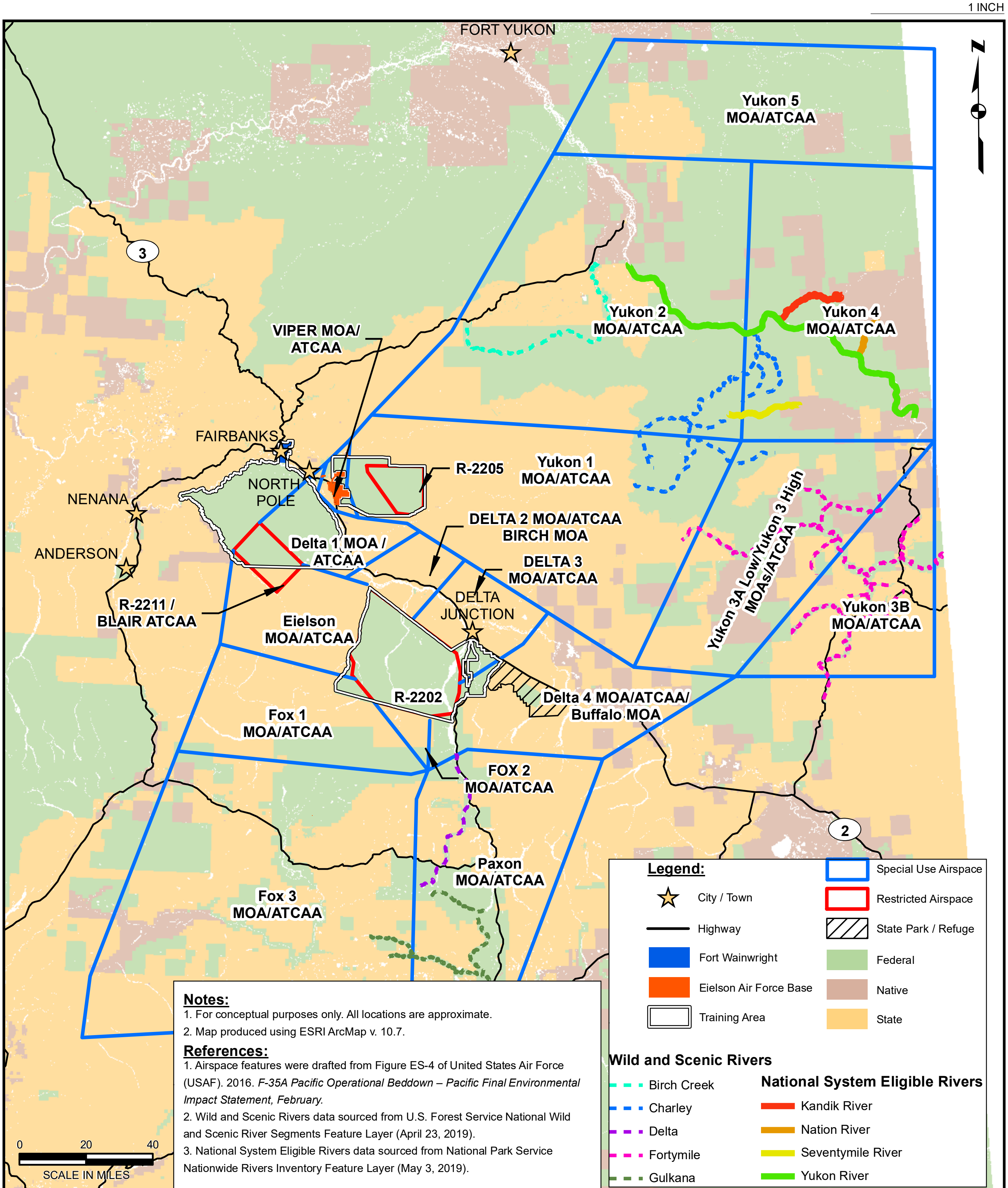
Table 3.4-2 Designated and Eligible Wild and Scenic Rivers in Northern JPARC Airspace

RIVER NAME	RESPONSIBLE AGENCY	REASON	ORVS
Delta River	BLM	Cultural	The southern stretches of the designated corridor are located within the Tangle Lakes Archaeological District and contain nearly 280 recorded archaeological sites. Almost all of the earliest known archaeological sites in the region are found within the designated river corridor, representing a history of humans hunting, mining and subsisting from more than 10,000 years ago through the recent past.
		Fish	Few rivers anywhere in the world can match the quality and quantity of the Arctic grayling fishery. High-quality lake trout fishing is available in late winter and early spring, as well. Tangle Lakes and the Delta River also support round whitefish, lake trout, burbot and longnose suckers.
		Recreational	This is one of a few easily accessible wild and scenic rivers in Alaska, providing both day use and overnight backcountry excursions. A wide range of outstanding recreational opportunities attract people of all ages and abilities for river-related solitude and the undisturbed environment, or for activities such as wildlife viewing, fishing, hunting, trapping, camping, hiking, snowmachining, skiing and photography. Boating opportunities include both lake and river paddling on clear and glacial water stretches, challenging whitewater and exceptional opportunities.
		Scenic	The corridor is flanked by both the low, rolling tundra hills of the Amphitheatre Mountains and the high, rugged, snow-covered peaks and ridges of the Alaska Range, offering high-quality scenic vistas. The river and surrounding hills provide undisturbed views of the river canyon, waterfalls, channelized riverbeds, tributaries, granite rock outcroppings and glacial alluvial processes.
		Wildlife	More than 100 species of migrating birds and waterfowl use the river corridor and the surrounding lakes as nesting areas. The trumpeter swan, a BLM sensitive species, is found in the wetlands of the Upper Tangle Lakes, and bald eagles frequent the area. Grizzly bears frequent the lowlands to fish and hunt where moose spend the summer and drop their calves. Tens of thousands of Nelchina caribou travel through this area during their annual migration to and from the calving grounds.
Gulkana River	BLM	Fish	The Gulkana is one of the most popular sportfishing rivers in Alaska, providing rich habitat for rainbow trout, arctic grayling, king salmon, red salmon, whitefish, longnose suckers, and lamprey. It is the leading king (Chinook) and red (sockeye) salmon-spawning stream in the Copper River basin. Grayling, rainbow trout and steelhead are resident species.

Table 3.4-2 Designated and Eligible Wild and Scenic Rivers in Northern JPARC Airspace

RIVER NAME	RESPONSIBLE AGENCY	REASON	ORVS
Gulkana River (cont'd)	BLM (cont'd)	Recreational	The Gulkana provides a variety of water conditions. It is one of a handful of road-accessible rivers in Alaska, yet provides opportunities for a remote and primitive experiences, particularly on the West Fork of the Gulkana. While the three forks are not considered whitewater rivers for most of their length, they include rapids rated up to Class III-IV. The corridor provides a remote setting for recreation and subsistence activities, such as boating, fishing, hunting, trapping, camping, hiking, snowmachining, skiing, photography, wildlife viewing and dogsledding. The Sourdough Section is accessible to powerboats.
		Scenic	Closely flanked by low, rolling hills, with the Wrangell Mountains and Alaska Range in the background, the Gulkana offers high-quality scenic vistas. It offers viewers and photographers opportunities to observe and photograph many aspects of nature—wildflowers, a variety of birds and animals are present in abundance.
		Wildlife	The Gulkana is home to a great diversity of wildlife and provides outstanding viewing opportunities. The over 60 species of birds in the area include bald eagles and trumpeter swans. More than 30 species of mammals can be found, including black and brown bears, moose, caribou, wolves, martens, wolverines, otters, weasels, minks, foxes, coyotes, lynxes, beavers, and muskrats.
National System-Eligible Rivers			
Kandik River	N/A	Wild	Outstanding biological diversity, historic structures, and an anadromous fish population.
Nation River	N/A	Wild	De facto wilderness and anadromous fisheries.
Seventymile River	N/A	Wild	Archeological sites, wildlife, and glacial features which are unusual in this region.
Yukon River	N/A	Recreational/Scenic	Historic site, recognized by Congress, with association to gold rush era on Yukon River. Geologic features show strata of Precambrian era. 700-million-year-old marine fossils.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: National System 2022b; NPS 2016



Notes:
1. For conceptual purposes only. All locations are approximate.
2. Map produced using ESRI ArcMap v. 10.7.

References:
1. Airspace features were drafted from Figure ES-4 of United States Air Force (USAF). 2016. *F-35A Pacific Operational Beddown – Pacific Final Environmental Impact Statement, February.*
2. Wild and Scenic Rivers data sourced from U.S. Forest Service National Wild and Scenic River Segments Feature Layer (April 23, 2019).
3. National System Eligible Rivers data sourced from National Park Service Nationwide Rivers Inventory Feature Layer (May 3, 2019).

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

Designated and Eligible Wild and Scenic Rivers in Airspace Used by Eielson Air Force Base Aircraft

DATE:	5/13/2022
PROJECT No.:	321004
DRAWN:	C.B.
FIGURE:	3.4-3

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3.4.3 Environmental Consequences

The USAF has defined significance indicators for water resources impacts. One indicator of significance is whether the proposed action would substantially affect water quality or violate established laws or regulations adopted to protect water resources. Other indicators of significance include substantially reducing water availability or supply to existing users, overdrafting groundwater basins, exceeding safe annual yield of water supply sources, endangering public health or safety by creating or worsening health or flood hazard conditions, or threatening or damaging unique hydrologic characteristics.

3.4.3.1 Proposed Action

Wetlands

Per the WOTUS determination, there are 0.41 acres of wetlands within the ROI (0.00004% of Eielson AFB total wetlands) that would be impacted by the dormitory project associated with the Proposed Action (Stantec 2022). [Add OUTCOME OF USACE consultation/concurrence WHEN AVAILABLE]. The new dormitory required siting in close proximity to the dining facility, in a location that conforms to the IDP. Consequently, there was no practicable alternative to siting the project in an area with minor wetlands impacts. Garrison Slough and the freshwater pond it is connected to are WOTUS; short-term direct adverse impacts to surface waters could result from clearing, grading, trenching, and excavating, which could displace soils and sediment into Garrison Slough. Prior to construction USAF would obtain coverage under an individual Section 404 permit for discharge of dredged or fill material to wetlands. Construction would be conducted in accordance with the Eielson AFB APDES permit for stormwater management and would be consistent with the mitigation measures outlined in the base SWPPP. Soil erosion and sediment controls and construction site waste controls that would be employed to minimize impacts to surface waters are discussed in Section 3.4.3.1 – Surface Waters.

Floodplains

According to the FEMA flood insurance rate map for Eielson AFB, approximately 49% of the installation is within the 100-year floodplain of the Tanana River. The floodplains to the east of the Richardson Highway form a pocket between higher elevations on the developed portion of the base and the hills to the east. Outside of the developed portions of the base, the FEMA 100-year floodplain is dominated by a mixture of vegetation types, ranging from white spruce-hardwood forests on the west side of the Richardson Highway to black spruce brushfields and wetlands on the east side. During a 100-year flood event, movement of water in the vicinity of Eielson AFB would be slow due to its distance from the Tanana River's main channel, lack of a high-flow volume outlet to the north, and the density of vegetation between the base and the main channel. As most of the area outside the flightline is heavily vegetated with forest, brush, and wetland species, the flow of floodwaters would be slowed or impeded by vegetation trapping or filtering out woody debris and silt.

Approximately 19 acres (11%) of the 168-acre ROI overlaps the 100-year floodplain. Of this area, new construction associated with the fuel receipt tank project associated with Proposed Action would have the potential to affect approximately 26,000 SF (0.6 acres) of FEMA 100-year floodplain/SFHA. The loss of permeable surface area from the Proposed Action would result in 208,000 cubic feet of flood water displacement and a 0.00051-foot increase in base flood elevation. While this represents a long-term impact to the floodplain, the increase in base flood elevation would not be expected to have a significant adverse impact on the floodplain's ability to moderate floodwater impacts.

Pursuant to EO 11988, if a federal government agency proposes to conduct an activity in a floodplain, it will consider alternatives to the action and modify its actions, to the extent feasible, to avoid adverse effects or potential harm. The following three requirements set forth in EO 11988 were evaluated and incorporated into the planning process for this action:

1. Avoid direct or indirect development within the floodplain wherever there is a practicable alternative. If no practicable alternatives exist, impacts to floodplains would be minimized to the extent possible.
2. Minimize the impact of floods on human safety, health, and welfare—road access in and out of the ROI is more than adequate to evacuate personnel in advance of a 100-year or greater flood event.
3. Restore and preserve the natural and beneficial floodplain values—steps would be taken to preserve floodplains values by minimizing vegetation removal and the number of impervious surfaces being added on the base.

The Proposed Action construction and renovation projects were developed based on a comprehensive evaluation of manpower, operations, logistics, facilities, vehicles, total force integration, and support capabilities, among other criteria (PACAF 2022). Proximity to the flightline was also considered. Despite the abundance of floodplain on Eielson AFB most developments (89%) are planned for outside the floodplain. The fuel receipt tank project is the only project with the potential to impact floodplains. The project location required siting that allowed for tie-in to existing piping infrastructure and must be within a designated area for future jet fuel tank expansion. As such, there was no practicable alternative to siting the project within a floodplain.

Section 3(a) of EO 11988 requires the construction of federal structures and facilities to be consistent with the intent of the standards and criteria promulgated under the NFIP. Although the USAF has determined it is not required to obtain a floodplain permit from the FNSB for the Proposed Action, it will consider implementing requirements of Borough Code 15.04.110. Instead, the USAF would minimize impacts to floodplains through adherence to federal building standards detailed in 41 CFR 102-76.10(c), and policies and procedures outlined in the Eielson AFB Integrated Natural Resources Management Plan (INRMP). These include:

- Avoid expansion into floodplains whenever possible.
- When an action is proposed for a floodplain, consult the Floodplain Management Services Section of the U.S. Army Corps of Engineers (USACE), and follow their recommendations.
- Maintain up-to-date floodplain maps—The Eielson AFB Natural/Cultural Resources Section will update the GIS floodplains maps for Eielson AFB managed lands as needed.

Based on this review and the information available at the time of analysis, the USAF finds that there are no practicable alternatives to locating proposed KC-135 facilities within the Tanana River 100-year floodplain.

Per EO 11988, public review and comment must be solicited for any project that proposes development within a 100-year floodplain. [ADD PUBLIC PARTICIPATION INFO WHEN AVAILABLE].

Surface Waters

The Proposed Action would not result in control or modification of the water of any stream or other water body; therefore, coordination under the FWCA is not required.

The proposed new construction, in conjunction with the KC-135 aircraft reorganization, includes the addition of a 420,000-gallon fuel storage tank adjacent to the existing fuel storage tanks located off Flightline Avenue. Once constructed, this tank would be located approximately 200 feet southwest of the pond connected to Garrison Slough and add to the impervious acreage at the base. Protective measures, as outlined in the Eielson AFB Oil and Hazardous Substance Discharge Prevention and Contingency Plan

(ODPCP), such as constructing adequately sized secondary containment and inspecting collected precipitation for sheen before discharging to the drainage channel that connects to the pond, would be implemented for the installation of the new bulk storage tank.

While the pond connected to Garrison Slough is not a wetland, it provides some wetland function and value, such as water storage; food, water, and shelter for fish, birds, and mammals; and sediment-trapping. No fishing is allowed in Garrison Slough or the pond due to high levels of polychlorinated biphenyls (PCBs). The Proposed Action would not impact the pond or jeopardize its continued functions.

The Proposed Action would add an estimated 361,786 SF (8.30 acres) of impervious surfaces (refer to Tables 2.1-2, 2.1-3, and 2.1-4). The total area of disturbance is estimated to be 378,236 SF (8.68 acres). Short-term direct adverse impacts to surface waters could result from construction such as clearing, grading, trenching, and excavating, which could displace soils and sediment into nearby waterbodies. However, construction would be conducted in accordance with the APDES permit for stormwater management to mitigate these impacts: erosion and sediment controls (e.g., silt fences and sediment traps downslope from construction) and stormwater BMPs (e.g., spill cleanup and appropriate disposal) would be implemented and be consistent with the base SWPPP. Therefore, the anticipated impacts to surface water and stormwater runoff from the Proposed Action would be negligible.

Groundwater

Groundwater recharge to the aquifer system would be adversely impacted if new impervious surfaces increased runoff to nearby water bodies, thereby decreasing infiltration to the subsurface and the aquifer. Because sufficient areas of the floodplain would continue to be available for groundwater recharge and filtration, this impact, while long-term, would be negligible

There are no sole source aquifers on Eielson AFB (USEPA 2021a); therefore, there would be no impact to sole source aquifers from the Proposed Action.

Current on-base water demand is 750,000 to 800,000 GPD. The DoD assumes that one person uses an average of 100 GPD of water. Those who work but do not live on-base can be assumed to use an average of 25 GPD. If the planned Permanent Party Dorm were fully occupied at 96 persons, on-base water consumption would increase by at least 19,900 GPD.

Though this increase represents a direct long-term adverse impact to the groundwater treatment system, the increased water demand would still be well below the water treatment plant capacity of 2.16 million GPD. The water treatment plant would be able to support the additional water demand from the additional personnel Therefore, the Proposed Action would not be expected to have a significant impact on groundwater.

Wild and Scenic Rivers

There are no designated Wild and Scenic Rivers, National System eligible rivers, or study rivers on Eielson AFB. Within Northern JPARC Airspace, there are five designated Wild and Scenic Rivers and four eligible rivers as identified by the NRI (Section 3.4.2.5). Although the KC-135 aircraft would conduct military operations in the airspace above designated and eligible Wild and Scenic Rivers, such activities would not occur in, or occur on land near, one of these rivers; would not affect the free-flowing characteristics of these rivers; or otherwise constitute an action requiring consultation with the CEQ or river-administering agency. No impacts to Wild and Scenic Rivers would be expected from the Proposed Action.

3.4.3.2 No Action Alternative

Under the No Action Alternative, no additional KC-135s and associated personnel would be assigned to the installation. Construction, demolition, and renovation projects to accommodate additional aircraft and personnel would not occur and would not directly place additional demands on the water system or contribute to stormwater discharges at Eielson AFB. Water quality and availability would remain unchanged when compared with existing conditions, having neither a beneficial nor adverse impact.

It is presumed that on-base improvements would continue regardless of whether the Proposed Action is implemented. Any new construction would result in an increase in impervious surfaces over time, as well as increased stormwater and wastewater discharges and potentially increased groundwater demand, if the improvements were accompanied by an influx of on-base personnel and/or full-time residents. The direct adverse impacts to sheet flows and groundwater would be long-term but not significant. No Wild and Scenic Rivers would be affected by base developments, as there are none present on Eielson AFB. Future on-base improvements are not expected to occur on or near surface waters; therefore, there would be no impact to this resource. If wetlands could be adversely impacted, the USAF would follow applicable regulations under the CWA and consult with the USACE to determine the intensity and duration of such impacts and define mitigation measures. For these reasons, significant adverse impacts to water resources would not be expected under the No Action Alternative.

3.4.4 Cumulative Impacts

3.4.4.1 Wetlands

There are 0.41 acres of wetlands identified in the ROI; however, at this time, no other projects have been identified that, in conjunction with the Proposed Action, would cause cumulative impacts to wetlands. As wetlands do exist on-base, it is likely that future projects could potentially cause impacts. USAF would obtain a Section 404 permit for projects requiring discharge or dredging of fill into wetlands; therefore, substantial cumulative impacts to wetlands would not be expected.

3.4.4.2 Floodplains

The majority of construction associated with the Proposed Action and alternatives as well as past, present, and reasonably foreseeable projects, would occur within the 100-year floodplain and would result in long-term cumulative adverse impacts to the floodplain. In accordance with EO 11988 and DoD Memorandum for Floodplain Management on DoD Installations (DoD 2014), the USAF would identify any new construction designs or renovations of existing installation facilities exceeding $7.5 million that occur within the floodplain. Flood mitigation measures would minimize inundation effects and notify the public as to why there was no practicable alternative to such development in the floodplain. Due to the broad and unconstrained nature of the floodplain, it is expected that the Proposed Action would have a negligible impact on-base flood elevation.

3.4.4.3 Surface Waters

Short- and long-term, minor, adverse, cumulative impacts on surface water could occur from the Proposed Action and related actions involving ground disturbance and increased impervious surfaces. Soil disturbance and related planned actions could result in erosion, sedimentation into local surface water conveyances, and the potential for associated water quality degradation. However, these risks would be minimized by conducting ground-disturbing activities in accordance with an APDES permit and the Eielson AFB SWPPP. Project design for new impervious developments would include stormwater conveyance features, as needed, to incorporate new sources of runoff into the installation's stormwater system and to maintain or restore predevelopment site hydrology to the maximum extent practicable. With these measures in place, substantial cumulative impacts to surface water are not anticipated.

3.4.4.4 *Groundwater*

The Proposed Action, including proposed construction, demolition, and renovation projects, could result in accidental spills or leaks of substances, such as fuels, oils, and other materials, that could have long-term, cumulative, adverse impacts to groundwater by contaminating groundwater and aquifers in the ROI. This potential would be minimized by employing equipment maintenance standards, using secondary containment for temporary storage of hazardous materials, and following project-specific BMPs. Implementation of the Proposed Action would increase the total area of impervious surface within the installation. Runoff from these surfaces would infiltrate within the installation or at discharge points within the installation boundary. Because the aquifer at Eielson AFB is broad and unconsolidated, with an extensive amount of undeveloped land in the watershed, cumulative adverse impacts to groundwater recharge would be minor, as there would be no substantial overall regional reduction in groundwater recharge from the Proposed Action and other installation actions. Cumulative adverse impacts to groundwater quantity would be long-term, but negligible.

3.4.4.5 *Wild and Scenic Rivers*

No designated or eligible Wild and Scenic Rivers are present at Eielson AFB, precluding the possibility of installation improvements resulting in cumulative adverse impacts to this resource.

3.5 Safety and Occupational Health

3.5.1 Definition of Resource

A safe environment is one in which no potential for death, serious bodily injury or illness, or property damage exists, or where that potential has been optimally reduced. Safety and occupational health address the well-being, safety, and health of members of the public, contractors, and USAF personnel during the various aspects of the Proposed Action and the No Action Alternative.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. The proper operation, maintenance, fueling, and repair of aircraft and equipment also carry important safety implications. Activities that can be hazardous include transportation, maintenance and repair, construction, and activities that occur in extremely noisy environments. This EA addresses the safety implications from construction, general O&M, and flight operations associated with the Proposed Action and No Action Alternative.

3.5.1.1 *Construction Safety*

Contractors performing construction are responsible for following federal Occupational Safety and Health Administration (OSHA) regulations and are required to conduct construction in a manner that does not increase risk to workers or the public. OSHA regulations set and enforce protective workplace safety and health standards. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, use of personal protective equipment (PPE), and availability of safety data sheets.

Employers are responsible for providing a safe workplace under OSHA. Employers must follow all relevant OSHA safety and health standards, including: review potentially hazardous workplace conditions; monitor exposure to workplace chemicals (e.g., asbestos, lead, other hazardous substances, contaminated soils), physical hazards (e.g., noise, falls), biological agents (e.g., infectious waste, wildlife, plants), and ergonomic stressors; recommend and evaluate controls (prevention, administrative, engineering, PPE) to ensure personnel exposure is eliminated or adequately controlled; and ensure a medical surveillance program is in place to perform occupational health physicals for workers subject to the use of respiratory protection or engaged in hazardous waste, asbestos, lead, or other work requiring medical monitoring.

3.5.1.2 Operations and Maintenance

Risk management guidance documents minimize loss of USAF resources and protect personnel from occupational deaths, injuries, or illnesses. Adherence to industrial-type safety procedures and directives ensures safe working conditions for DoD aircraft O&M. DoD Directive 4715.1E, Environment, Safety, and Occupational Health¸ and Air Force Instruction (AFI) 91-203, Air Force Occupational Safety, Fire, and Health Standards, provide industrial and occupational safety guidance for implementation of the OSHA standards in 29 CFR. AFI 91-202, The U.S. Air Force Mishap Prevention Program, guides mishap prevention program requirements, assigns program responsibilities, and contains program management information.

3.5.1.3 Flight Operations

The primary safety concern for military flights is the potential for aircraft mishaps (i.e., crashes or crash landings). Bird and wildlife strikes are also a flight safety concern due to the potential aircraft damage or injury to aircrews. AFI 91-212, Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program, provides guidance on establishing a BASH Program, which can significantly reduce strike hazards by properly managing habitat on and surrounding military airfields.

In accordance with DoD Instruction 4165.57 Air Installations Compatible Use Zones (DoD 2011), Accident Potential Zones (APZ) are established at military airfields to delineate recommended compatible land uses for the protection of people and property. AICUZ, including the Clear Zone, APZ I, and APZ II, is described in Section 3.2.2.1.

Airfield pavement condition is critical to safe flight operations. As required by AFI 32-1041, Civil Engineering Pavement Evaluation Program, Pavement Condition Index (PCI) surveys identify and document severity and quantity of airfield pavement surface distresses (USAF 2019a). The distresses are combined to determine the pavement PCI value, a number between zero (failed) and 100 (no distresses). These assessments are used to develop pavement deterioration curves and assist airfield staff in prioritizing areas for maintenance and rehabilitation. The critical PCI is the PCI value at which major maintenance and rehabilitation is required.

3.5.2 Affected Environment

Eielson AFB is a secure military installation with access limited to military personnel, civilian employees, military families, and approved visitors. O&M activities conducted on Eielson AFB are performed in accordance with applicable USAF safety regulations, published USAF Technical Orders, and standards prescribed by USAF Occupational Safety and Health requirements. The ROI includes the portion of Eielson AFB where the additional KC-135s would be housed, airfield pavements where the aircraft would park and operate, runway take-off and landing airspace zones, and where the associated construction, demolition, and renovation projects on the installation would occur.

3.5.2.1 Construction

Contractors performing construction on Eielson AFB are required to adhere to OSHA standards and USAF safety practices (Section 3.5.1).

3.5.2.2 Operations and Maintenance

The 354th Security Forces Squadron provides law enforcement and security services to Eielson AFB and safeguards both PAA and transient aircraft.

The 354th Medical Group (MDG) provides day-to-day medical services for Eielson AFB at the on-base primary healthcare clinic. Bassett Army Community Hospital on FWA is Eielson AFB's primary referral source for specialty and inpatient care.

Aircraft icing is a major weather hazard to aviation. Deicer fluid removes ice and snow and prevents further buildup; many icing-related mishaps have occurred when the aircraft was not deiced before takeoff (USAF 2012). Eielson AFB has three deicers, one tug, and associated warm storage to support winter flying operations and prevent aircraft icing issues.

The 354th Civil Engineer Squadron (CES) provides fire response services on Eielson AFB. Aircraft Rescue Fire Fighting services are available on a 24-hour basis. Crash and rescue services personnel coordinate emergency services in the event there is an in-flight or ground emergency. There are two fire stations at Eielson AFB. Fire Station #1 is located at the northern end of the flightline, within the approximate affected area. Fire Station #2 is located on Glacier Street, north of the base housing area. There is a required 7-minute response time for fire emergency services.

3.5.2.3 Flight Operations

Aircraft operations at Eielson AFB fluctuate over the year. The busiest months are April through October during the major flying exercises. PAA based at Eielson AFB are presented in Table 3.5-1. Because the base supports Red Flag-Alaska, Northern Edge, and other major flying exercises, more than a dozen types of transient aircraft (i.e., other US major units and allied nation visitors), temporarily operate from the base. Transient aircraft are not listed in Table 3.5-1. In calendar year 2014, 18,963 annual airfield operations were conducted by based and transient aircraft at Eielson AFB (USAF 2016). The existing KC-135 fleet at Eielson AFB logs two sorties per day and approximately 1,300 annual hours of flying time (Eielson AFB 2021f).

Table 3.5-1 Based Aircraft at Eielson AFB

UNIT NAME	PERMANENTLY ASSIGNED AIRCRAFT
354 Fighter Wing	21 F-16s
356 Fighter Squadron	54 F-35As
168 Air Refueling Wing	8 KC-135s
210 Rescue Squadron	2 HH-60s

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2016; Eielson AFB 2021i, 2022b.

The DoD defines four categories of aircraft mishaps: Classes A, B, C, and D. Class A mishaps are the most severe (resulting in death, permanent total disability, damage equal or greater than $2 million, or destroyed aircraft). Since 2011, there have been 0 Class A and B mishaps, 22 Class C mishaps (averaging 2 per year), and 33 Class D mishaps (averaging 3 per year) at Eielson AFB (Eielson AFB 2021i).

A bird/wildlife aircraft strike hazard exists at Eielson AFB due to the presence of resident and migratory birds and wildlife. Eielson AFB developed a BASH Program, which applies to host, associate, and temporary duty organizations on the installation, including the Air National Guard, and USAF Reserve members and units. Components of the BASH program include training, Exclusion Zones, habitat management, Bird Watch Condition, strike reporting, and a Bird Hazard Working Group (Eielson AFB 2021c). Since 2011, there have been 61 BASH strikes for an average of 5.5 incidents annually (Eielson AFB 2021i).

APZs have been established for Eielson AFB's airfield for the protection of people and property (Figure 3.2-1). Flight operations, including those carried out by the based KC-135s, are required to abide by existing airfield course rules and flight procedures that are protective of APZs. On-base, neither the Clear Zone nor the APZs include housing or other incompatible land uses. To the north, portions of the APZs overlay lands outside of the base. APZ I falls on lands identified as general use (which could be considered a compatible land use), and almost the entirety of APZ II overlays land uses identified as either residential or general use in Moose Creek. Seventy-two residences are located within APZ II in Moose Creek (USAF 2016). Land uses such as high-density housing, industry (which uses hazardous or flammable chemicals), and public use facilities are not recommended within APZ II-designated areas and conflict with USAF land use recommendations.

In the most recent PCI survey, primary pavements were assigned a critical PCI value of 70. Secondary and tertiary pavements were assigned a critical PCI value of 55. Findings from the 2019 survey indicate that at 18 years old, the overall airfield is at a PCI of 73 (Good). A total of 90 pavement sections were surveyed and of the 40 sections rated below 70, 35 of them (approximately 50% of the pavement area surveyed) are at or below their respective critical PCI value and need major maintenance and rehabilitation. It was estimated that the pavements at Eielson AFB are deteriorating at an average rate of 1.46 PCI points per year. The parking area for KC-135s (P/Q/R/S Tanker Row, considered to be primary pavement and part of the ROI) had an area-weighted average PCI of 64 (Fair; Applied Research Associates 2020).

3.5.3 Environmental Consequences

Any increase in safety risks is considered an adverse impact on safety. As defined by the USAF, indicators for significance regarding safety include substantial increases to risks associated with the safety of USAF personnel or the general public, and introducing a new safety risk for which USAF is not prepared or does not have adequate management and response plans in place.

The safety analysis contained in the following sections addresses issues related to the health and well-being of both military personnel and civilians living on or near Eielson AFB and under training airspace. The below presents information on fire risk and management, and hazards associated with aviation safety.

3.5.3.1 Proposed Action

Construction Safety

Multiple construction projects would occur to accommodate the incoming aircraft and personnel. No unique construction practices or materials would be required that would change existing safety procedures. During construction, standard OSHA industrial safety standards and USAF safety practices would be followed. Minor, short-term adverse impacts may occur as some proposed construction sites would involve excavation and management of PFAS-contaminated soil; details regarding handling and disposal of PFAS-contaminated soil are discussed in Section 3.6.3.1. No unusual safety risks would be expected from construction; the Proposed Action would not significantly impact installation construction safety.

Operations and Maintenance

Should flight medicine come with the incoming supporting personnel, it would be co-located with the 354th MDG. For analysis of Proposed Action effects on installation medical services, refer to Section 3.10.3.1.

The Proposed Action would bring two additional deicers and one additional tug to Eielson AFB to maintain deicing capabilities appropriate for the number of installation aircraft. An Aerospace Ground Equipment (AGE)/Deicer Complex would be built to accommodate the additional equipment and consequently, no significant impact to safe winter flying operations would be expected.

KC-135 aircraft O&M would proceed as normal, with an increased number of personnel performing these duties. The safety risks for these activities would remain the same, with no new safety risks introduced. Personnel would continue to comply with OSHA standards and USAF policies for a safe working environment. No significant impacts to O&M safety would be expected.

Additional occupational safety personnel would be included with incoming personnel. They would be incorporated into the existing safety program and assist with the increased safety program workload. The additional aircraft would be parked and operated out of the same spaces as the existing KC-135s; therefore, the required 7-minute response times for fire emergency services would be met. While an increased mission set would bring greater risk, significant impacts to occupational safety and emergency services would not be expected because safety measures would be proportionally augmented. Any adverse impacts would be short-term and negligible in nature.

Flight Operations

Existing approved MOAs and Military Training Routes (MTRs) would be used by the KC-135s, and there would be no changes to airspace structure or flight patterns from the Proposed Action. The capacity of the JPARC airspace to accommodate the increase in flight operations would be unaffected; the airspace would continue to be managed to ensure operational safety with the increase in training.

Flight operations (sorties and annual flying hours) are expected to increase three-fold due to the increased number of aircraft (PACAF 2022). Therefore, the number of KC-135 sorties would be expected to increase from 2 to 6 per day, and annual flying hours would be expected to increase from 1,300 to 3,900 hours. The 4.7% increase in total aircraft on-base can be applied to aircraft mishap and BASH incident data from the previous 10 years to extrapolate the number of anticipated annual incidents with 89 total aircraft, once the KC-135 beddown has completed. A 4.7% increase in Class C and D mishaps would raise the annual number of incidents to 2.1 and 3.1, respectively. A 4.7% increase in BASH incidents would raise the annual number of strikes from 5.5 to 5.8. The BASH Program would continue to minimize exposure to potentially hazardous bird and wildlife strikes. These increases would be negligible, adverse, and long-term in nature.

No changes to existing APZs or Clear Zones would be required to accommodate KC-135 operations. The 72 residences would remain within APZ II in Moose Creek; however, the KC-135s would follow established airfield course rules and flight procedures to ensure that no new or increased safety risks would be introduced to the installation or adjacent community populations; consequently, no adverse impacts would be expected regarding APZs and Clear Zones.

Additional aircraft and associated support vehicles (e.g., mobile refuelers, aircraft maintenance vehicles) using the airfield pavement would increase the rate at which the pavement deteriorates, resulting in long-term, moderate, adverse impacts. An increase exceeding 200% of current KC-135 operations along with increased aircraft gross weights compared to training sortie weights will continue to degrade existing pavement (PACAF 2022). Parking area P/Q/R/S Tanker Row, the designated parking area for KC-135 aircraft, had a weighted average PCI of 64 in 2019 and is deteriorating at an estimated average rate of 1.46 PCI points per year (Applied Research Associates 2020), which places the current estimated PCI of P/Q/R/S Tanker Row at 61.08. If a 200% increase in aircraft usage is applied to the average deterioration rate, the Proposed Action could accelerate the rate to 4.38 PCI points per year. With the addition of four aircraft, it would take approximately 1 year and 5 months for the PCI of P/Q/R/S Tanker Row to fall from the PCI Range for "Fair" condition (56-70) to "Poor" condition (0-55). In its current state, the airfield can continue to sustain operations at a steady state with some degradations. Repair projects related to the South Ramp and Tanker Row are identified but unfunded (PACAF 2022).

The Proposed Action would not introduce new safety risks, nor substantially increase existing safety risks; therefore, there would not be significant impacts to flight operations safety.

3.5.3.2 No Action Alternative

Under the No Action Alternative, there would be no additional aircraft brought to Eielson AFB and no change to KC-135 flight O&M. No additional support personnel would be stationed at the installation and none of the construction projects associated with the Proposed Action would occur. Health and safety conditions would remain unchanged when compared with existing conditions described in Sections 3.5.1 and 3.5.2; OSHA and USAF safety practices would continue for future base developments that involve construction, having a beneficial impact to safety. Current and future operations would continue to adversely impact airfield pavements, until such time that repairs and/or replacement projects are programmed to extend the life of those pavements. If flight operations were to change in the future based on changing operational needs or the addition of new types of aircraft to the base (e.g., airfield course rules, flight procedures), USAF would work to ensure that no new or increased safety risks would be introduced to the installation or adjacent community populations.

3.5.4 Cumulative Impacts

3.5.4.1 Construction Safety

It is expected that Eielson AFB will continue the trend of development, and facility repairs, renovations, and new construction projects will be programmed for years to come. For example, in 2021, Eielson AFB was selected to pilot the first Department of the Air Force micro-reactor, anticipated to be operational by the end of 2027 (USAF Office of the Deputy Assistant Secretary for Environment, Safety, and Infrastructure [SAF/IE] 2021a). At the time of analysis, no planned projects would overlap geographically with Proposed Action projects; however, they may overlap in timing. Consequently, there would be potential for short-term, minor, cumulative adverse impacts on construction safety (e.g., slips, falls, exposure to various hazards). The Proposed Action and any future base development projects would ensure safe construction practices and would comply with OSHA standards and USAF safety practices to mitigate any risks and any potential adverse cumulative impacts to safety.

3.5.4.2 Operations and Maintenance

Long-term, minor, adverse impacts would be expected for O&M safety due to cumulative effects from the Proposed Action and the ongoing phased beddown of the F-35A Program. Though the nature of aircraft O&M for the existing KC-135s and F-35As would not change, the amount of personnel would increase, thereby increasing the potential for safety incidents to occur. Adherence to OSHA standards and USAF safety practices would maintain safe working environments.

3.5.4.3 Flight Operations

The F-35A beddown reached 100% completion as of April 2022, resulting in 85 aircraft based at Eielson AFB. The proposed four additional KC-135s represent a 4.7% increase in the number of base aircraft using shared airfield pavements (runways, taxiways, and parking areas). The average pavement deterioration rate would be expected to increase from 1.46 to 1.52 PCI points per year. BASH incidents would be expected to average at 5.7 strikes annually. Class C and D mishaps would be expected to average at 2.1 and 3.1 incidents annually. These would be considered minor adverse long-term cumulative impacts.

3.6 Hazardous Materials/Waste

3.6.1 Definition of Resource

3.6.1.1 Hazardous Materials and Hazardous Waste

Hazardous materials are defined by 49 CFR 171.8 as hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 USC 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infections characteristics may:

- Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Petroleum products include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Evaluation of hazardous materials and wastes focuses on the storage, transportation, handling, and use of hazardous materials, as well as the generation, storage, transportation, handling, and disposal of hazardous wastes. In addition to being a threat to humans, the improper release or storage of hazardous materials, hazardous wastes, and petroleum products can threaten the health and well-being of wildlife species, habitats, soil systems, and water resources.

Storage of bulk petroleum products is regulated federally under 40 CFR 112, Oil Pollution Prevention for any facility with an aggregate storage of more than 1,320 gallons of oil. 40 CFR 112 requires facilities to develop a Spill Prevention, Control, and Countermeasures (SPCC) plan that describes spill response measures to be used in the event of a release and other information. Alaska also regulates bulk petroleum storage under Article 4 of 18 Alaska Administrative Code (AAC) 75, Oil and Other Hazardous Substances Pollution Control. Article 4 requires facilities with greater than 420,000 gallons of oil storage to develop an ODPCP, describing spill response measures, potential spill scenarios, and other information.

3.6.1.2 Toxic Substances

Toxic substances are specific substances whose manufacture, processing, distribution, use, or disposal are restricted by the Toxic Substances Control Act (TSCA; 40 CFR 700-766) because they may present unreasonable risk of personal injury or health of the environment. They include asbestos-containing materials (ACM), lead-based paint (LBP), PCBs, and radon. Radon is a naturally occurring odorless and colorless radioactive gas found in soils and rocks that can lead to the development of lung cancer. Radon tends to accumulate in enclosed spaces, usually those that are below-ground and poorly ventilated (e.g., basements). USEPA established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences, and radon levels above this amount are considered a health risk to occupants. USAF policy is to prevent exposure at indoor radon levels above 4 pCi/L.

3.6.1.3 Contaminated Sites

In 1986, Congress created the Defense Environmental Restoration Program (DERP). DERP addresses the identification and cleanup of hazardous substances and military munitions remaining from past activities at military installations and formerly used defense sites. Through DERP, contaminated sites are investigated, and remedial actions are implemented in accordance with federal and state regulations. When no further remedial action is necessary and it no longer represents a threat to human health, the site is closed.

3.6.2 Affected Environment

The ROI for hazardous materials and hazardous waste impacts analysis includes the portion of Eielson AFB where the additional KC-135s would be housed and where associated construction, demolition, and renovation projects would occur.

3.6.2.1 Hazardous Materials

Hazardous materials are used at Eielson AFB in support of aircraft O&M missions, including petroleum, oil, and lubricants management and distribution. Hazardous materials used for aircraft maintenance include solvents, solder (lead and silver), batteries, liquid cooling oil, lubricating oils, sludge oil, hydraulic fluid, paint, jet propellant-8 (JP-8) fuel, diesel fuel, motor gasoline, antifreeze, scrap metal, bead blast metals (lead and cadmium), and contaminated solids. In addition, an on-base hydrazine facility services F-16 hydrazine systems. Due to the high number of aircraft operations, fuel is stored in large quantities on-base. The largest containers are two 4,298,961-gallon JP-8 aboveground storage tanks at the E-2 Complex. The cumulative storage capacity is 30,995,160 gallons; this includes JP-8, diesel, and JP-4 tanks

(Eielson AFB 2021d). The Eielson AFB ODPCP addresses spill prevention, contingency planning, and emergency response (Eielson AFB 2021d), satisfying federal and state regulatory requirements.

3.6.2.2 Hazardous Waste

Eielson AFB is regulated as a large quantity hazardous waste generator under RCRA. The Eielson AFB Hazardous Waste Management Plan (HWMP) governs the Eielson AFB Hazardous Waste Management Program (Eielson AFB 2021j). Building 4388 houses the Hazardous Waste Facility and serves as the 90-day central accumulation site. There are 27 satellite accumulation points near work locations and 3 other accumulation sites. The Civil Engineer Environmental Element oversees the Hazardous Waste Program and the Infrastructure Systems oversees Hazardous Waste Facility O&M. Typical hazardous waste streams for aircraft maintenance include: abrasive blast media; aerosol cans; Alodine; asbestos brakes; batteries; oil and fuel filters; paint booth filters; parts washer filters; glycol; hydrazine (F-16 aircraft); oil/water separator sludge; paints and primer wastes; solvent-contaminated patches and Q-tips; contaminated rags; rinse water; sealing kits and compounds; used oil and fuels; parts washer and solvent tank sludge; and weapons cleaning solution (Eielson AFB 2021j). Table 3.6-1 presents waste streams handled from buildings affected by the Proposed Action from September 2020 through September 2021.

Table 3.6-1 Waste Streams from Buildings Affected by Proposed Action

WASTE STREAM NAME	NUMBER OF CONTAINERS PROCESSED	CONTAINER SIZE	TOTAL VOLUME OVER 12 MONTHS
Hazardous rags	1	5 gallon	5 gallons
Bead blast media	2	5 gallon	10 gallons
Diesel, JP-8 filters	1	30 gallon	30 gallons
Empty aerosol cans	16	5 gallon	80 gallons
Lithium batteries	5	1 gallon	5 gallons
Lithium metal/alloy	6	5 gallon; 1 gallon	14 gallons
Ni-Cad batteries	1	1 gallon	1 gallon
No RQ rags with cadmium	2	5 gallon	10 gallons
Oil absorbents, energy recovery	15	55 gallon	825 gallons
Paint rel. liquid hazwaste	2	5 gallon	10 gallons
Paint rel. solid hazwaste	6	30 gallon	180 gallons
Purged aerosols	3	5 gallon	15 gallons
Sealant kit, promoter	18	5 gallon	90 gallons
Sealant kits with promoter, no RQ	1	5 gallon	5 gallons
Spent fluorescent lamps	5	Not listed	5 bags
Toxic rags absorbents	1	5 gallon	5 gallons
Used oil	5	55 gallon	275 gallons
Used oil/hydraulic oil filter	1	30 gallon	30 gallons
TOTAL			**1,590 gallons + 5 bags**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: Eielson AFB 2021e
Data represent waste containers processed from September 2020 through September 2021 for buildings within the ROI (Bldgs 1161, 1168, 1176, 3112, 3129, 3130, and 3133).

3.6.2.3 Toxic Substances

Eielson AFB is located in a Radon Zone 2 area, meaning the predicted average radon screening level is ≥ 2 and ≤ 4 pCi/L (USEPA 1993, 2021b). Of the buildings affected by the Proposed Action, radon historical records are only available for Building 1171; a 2013 radon survey showed radon levels at 0.6 pCi/L and 0.2 pCi/L, below the USEPA action level of 4 pCi/L (Eielson AFB 2021k).

Radon testing is not required for construction/design specifications at Eielson AFB; however, testing for radon is required 1 year after the construction of new buildings. The 354 MDG/Operational Medical Readiness Squadron (OMRS) recommends radon testing following any significant renovations or heating, ventilation, and air conditioning (HVAC) replacement. The 354 MDG/OMRS is notified of planned new construction and renovation projects on-base through the AF 813 work order review and approval process (Eielson AFB 2021l).

The Eielson AFB Asbestos Management Plan details procedures to prevent or minimize installation occupant and worker exposure to ACM, including managing asbestos wastes, which are disposed of at an on-base permitted landfill (Eielson AFB 2018b). No buildings affected by the Proposed Action in Table 3.6-2 have known ACM.

From the 1950s through the 1970s, PCBs were widely used in caulking and elastic sealant materials. These materials were primarily used for windows, door frames, stairways, building joints, masonry columns, and other masonry building materials (USEPA 2015b). PCBs also can be found in transformer oil due to their electrical insultation properties. PCB transformers and large capacitors on Eielson AFB are certified to contain less than 50 ppm PCBs (Eielson AFB 2021j).

PCB-containing light ballasts are commonly found in all but the most modern facilities and have a long service life, making it difficult to know where they are until immediate inspection prior to demolition or renovation. PCB-containing light ballasts are potentially present in buildings that would be affected by proposed demolition and renovation. When disposing of light ballasts manufactured before 1978 that are still in service and not labeled "NO PCBs," the light ballasts are containerized, marked with the date removed from service, and turned in to the Hazardous Waste Facility for disposal, in accordance with the HWMP (Eielson AFB 2021j).

Older facilities on Eielson AFB may have been painted with LBP. Alterations of structures suspected of containing LBP are conducted in accordance with applicable regulations and according to the Eielson AFB LBP Management Plan (Eielson AFB 2015). Samples of potential LBP are screened using a toxicity characteristic leachate procedure to determine if the LBP meets/exceeds RCRA levels and to determine the proper disposal process. Proper disposal of any lead-containing wastes is in accordance with federal regulations. Existing buildings affected by the Proposed Action with known LBP are presented in Table 3.6-2.

Table 3.6-2 Proposed Demolition and Renovation Projects with Known ACM/LBP

BUILDING	PROJECT TYPE	KNOWN ACM	KNOWN LBP
1173 Tug & Deicer Warm Storage	Demolition	None	None
1174 Refueling Pump Station	Demolition	None	LBP present in painted markings on concrete.
1168 Maintenance	Renovation	None	None
1171 Fuel Cell Hangar	Renovation	None	None
1172 AGE Warm Storage	Renovation	None	None
1176 (CTK/Storage) Composite Maintenance Hangar Bay	Renovation	None	LBP present at low concentrations in floor paint markings.

Table 3.6-2 Proposed Demolition and Renovation Projects with Known ACM/LBP

BUILDING	PROJECT TYPE	KNOWN ACM	KNOWN LBP
3129 Squad Ops	Renovation	None	None
3229 Fuel/Fire Vehicle Maintenance	Renovation	None	Possible LBP; building constructed in 1987. No samples have been taken to date.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: Eielson AFB 2020b

3.6.2.4 Contaminated Sites

The DoD developed the Environmental Restoration Program (ERP) to facilitate cleanup of sites contaminated by past military activities and regulated under CERCLA. The USEPA and State of Alaska jointly regulate the sites with CERCLA contaminants. Petroleum-contaminated sites are designated as Compliance Restoration Sites and are regulated by the state. Figures 3.6-1 and 3.6-2 show Environmental Restoration Program and Compliance Restoration sites within and adjacent to the ROI. Table 3.6-3 provides site descriptions.

Table 3.6-3 Environmental Restoration Program, Compliance Restoration, and PFAS Contamination Sites

SITE NUMBER	SITE NAME	DESCRIPTION	KEY COC(S)
DP025	E-6 Tank Farm	Contamination due to at least four jet fuel spills.	BTEX, GRO, DRO, lead in groundwater
SO116	Bldg 1176	Petroleum contaminated soil was discovered when 3 USTs storing JP-4, gasoline, and diesel were upgraded. Cause of releases are leaks, spills, and overflows.	GRO in soil
SO501	Bldg 1146	Associated with location of a former 2,500-gallon diesel fuel UST that was removed in May 1993.	GRO, DRO, 1,2,4-TMB, 1,3,5-TMB, 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene, naphthalene, and xylenes in soil DRO, 1-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, and naphthalene in groundwater
SS035	Asphalt Mix Area	Area active in 1950s-1960s. Commingled waste oils and solvents mixed with contaminated fuels, disposal of asphalt drums at site have led to contamination of DDT in soil and sediments. Garrison Slough Pond surface water sampling identified PFOS/PFOA and PFAS contamination.	PFOS, PFOA, PFAS, DDD in surface water DDT in soil and sediment DDD, DDE in sediment

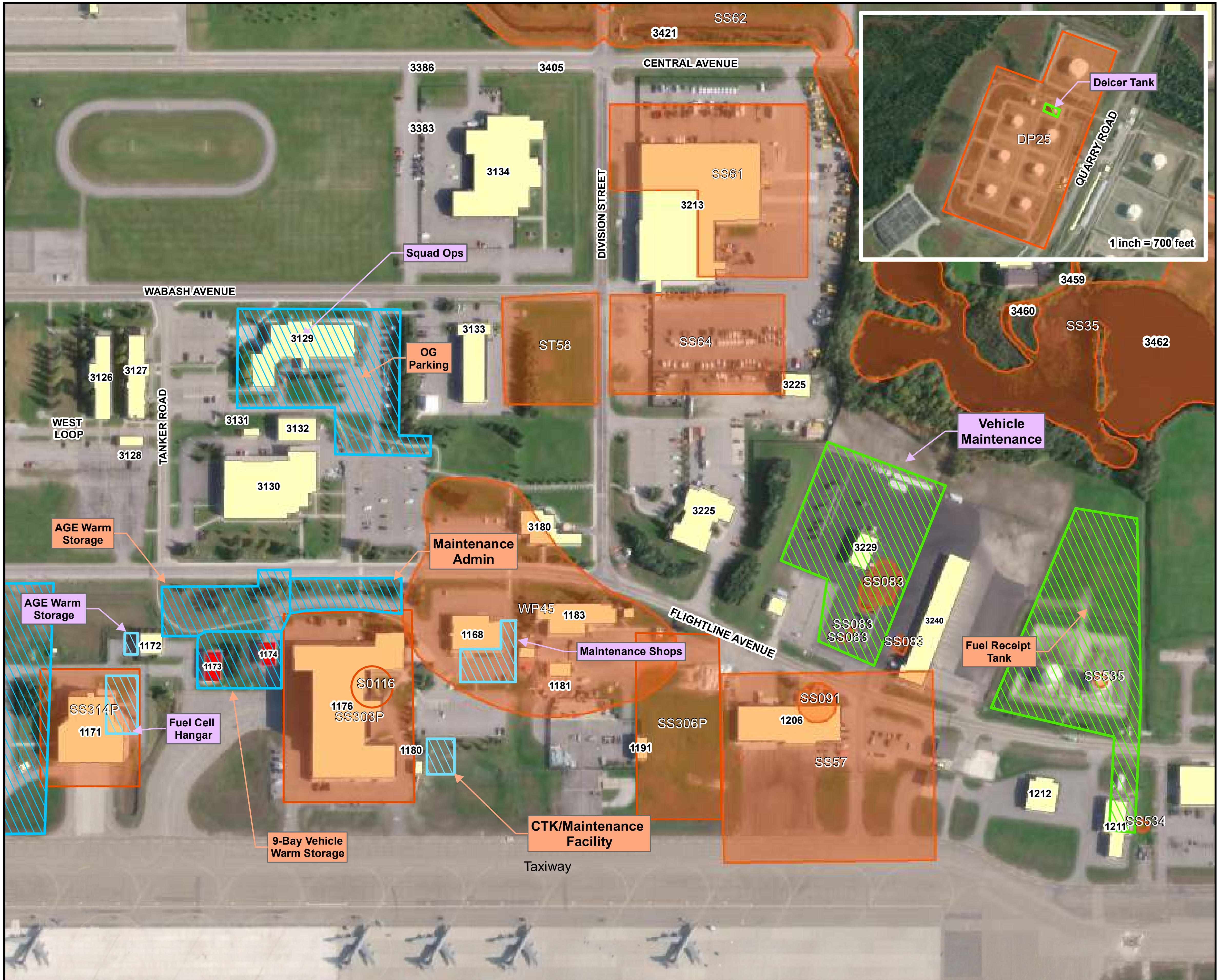
Table 3.6-3 Environmental Restoration Program, Compliance Restoration, and PFAS Contamination Sites

SITE NUMBER	SITE NAME	DESCRIPTION	KEY COC(S)
SS057	Bldg 1206	A former maintenance shed/fire training area is likely source of TCE contamination in soil and groundwater. Solvents and waste fuels were dumped into pits and burned in the fire training area. Managed together with Site WP045.	TCE in soil (37,000 µg/kg) and gw (39,000 µg/L) Cis-1,2-DCE in gw (3,300 µg/L) Benzene in soil (39 µg/kg) and gw (12 µg/L)
SS061	Vehicle Maintenance Building 3213	Historically, waste fuels, oils, solvents, antifreeze, and water room maintenance activities at the shop were processed through an OWS. The oil fraction was recovered for reuse and the water was discharged into 2 former dry wells at the south end of the building.	TCE, PCE, cis-1,2-DCE, vinyl chloride in gw
SS062	Garrison Slough	The slough may have received contamination from several different sources at the base (e.g., ST011, SS035, and SS067).	PCBs in fish; PFOA/PFOS in soil, sediment, porewater, surface water, and biota
SS079	Bldg 2207 Dining Hall CITS	Former Bldg 2207/Dining Hall site has historical petroleum contamination.	DRO in soil (23,700 mg/kg) DRO in gw (1.99 mg/L)
SS083	BLDG 3240 R-11 Parking Lots	Two 90-gallon ASTs used to store diesel fuel near the site.	GRO, DRO, RRO, VOCs, PAHs in soil
SS091	Bldg 1206 Fire Station #1	Unknown release discovered during a trench excavation. Tarry substance along sidewall of trench was sampled and removed; confirmation sampling indicates contamination remains and is undelineated.	GRO, DRO, VOCs, PAHs in soil
SS303P	AFFF Area #2, ANG KC-135 Hangar (Bldg 1176)	Bldg 1176 was formerly equipped with an AFFF fire suppression system. There was a reported release of foam that produced 20 vertical feet of foam that may have been pushed out the west doors to the nearby grassy areas.	PFOA/PFOS in soil (9.9 µg/kg) and gw (9.7 µg/L)
SS306P	Site 3 Former Ball Field Spray Test Area and Garrison Slough	In the 1980s, Eielson AFB Fire Department reportedly performed multiple AFFF spray pattern tests in this area.	PFOA/PFOS in soil and gw.
SS314P	AFFF Area #1, ANG Hangar (Bldg 1171)	Bldg 1171 is equipped with an AFFF fire suppression system including an 800-gallon tank of AFFF. There was a small amount of fire suppression discharged in the mechanical room (date unknown) with possible release beyond the mechanical room door on the eastern side of the building.	PFOA/PFOS in gw (5.0 µg/L) Soil not sampled

Table 3.6-3 Environmental Restoration Program, Compliance Restoration, and PFAS Contamination Sites

SITE NUMBER	SITE NAME	DESCRIPTION	KEY COC(S)
SS521	Bldg 1161	During the installation of a communication line in 2000, soil affected by petroleum hydrocarbon contamination was encountered in 5 general areas, including SS521.	PCP and metals in soil DRO, PCP, and total metals in gw
SS534	Hydrant Fuel System Bldg 1211	Contamination at the site caused by spills of JP-8 in 2008, 2009, and 2011.	DRO in soil and gw
SS535	Hydrant Fuel System Tank 5	Two JP-8 spills from Tank 5 have been reported in the containment area. Releases have occurred from fuel pipelines that connected Tank 5 to Bldg 1211.	DRO and benzene in soil DRO and arsenic in gw
ST011	Fuel-Saturated Area	Subsurface diesel fuel contamination associated with former Bldg 3224 USTs and associated piping.	COPCs in groundwater: GRO, DRO, RRO, EDB, PAHs, benzene, VOCs, and lead. COPCs in subsurface soil: pesticides, SVOCs, and metals (arsenic, beryllium, manganese). COPCs in surface soil: SVOCs.
ST058	Old Quartermaster Service Station Site	Possible releases from aboveground tanks. The service station was a source of petroleum products for private vehicles.	BTEX and lead
WP045	Photo Lab	A drywell in Bldg 1183 is a likely source of TCE contamination in soil and groundwater. Photo chemicals were disposed of in the drywell. Managed together with Site SS057.	TCE in soil (37,000 µg/kg) and gw (39,000 µg/L) Cis-1,2-DCE in gw (3,300 µg/L) Benzene in soil (39 µg/kg) and gw (12 µg/L)

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: Eielson AFB 2021g, 2021m; ADEC 2021a, 2021b



1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

ENVIRONMENTAL RESTORATION PROGRAM SITES AND COMPLIANCE RESTORATION SITES WITHIN ROI - PROPOSED CONSTRUCTION, RENOVATION, AND DEMOLITION PROJECTS AREA

Legend

- Contaminated Site
- 168 WG Parcel
- 354 FW Parcel
- Demo
- Building
- New Construction
- Refurbish/Renovation

Abbreviations

AGE	Aerospace Ground Equipment
CTK	Composite Tool Kit
EA	Environmental Assessment
OG	Operations Group
ROI	Region of Influence

Notes

1. Map produced using ESRI ArcMap v. 10.7.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2022. KC-135 Beddown & SATAF. Map prepared by 354 CES/CENPL. January.
3. Location and extent of sites SO116, SS303P, SS306P, and SS314P approximated from Eielson Air Force Base Environmental Restoration Program Atlas (2021).

N

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONTAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

260 130 0 260 520
SCALE IN FEET

PROJECT No.: 321004	DATE: 5/13/2022	FIGURE: 3.6-1
P.M.: M.V.	DRAWN: C.B.	

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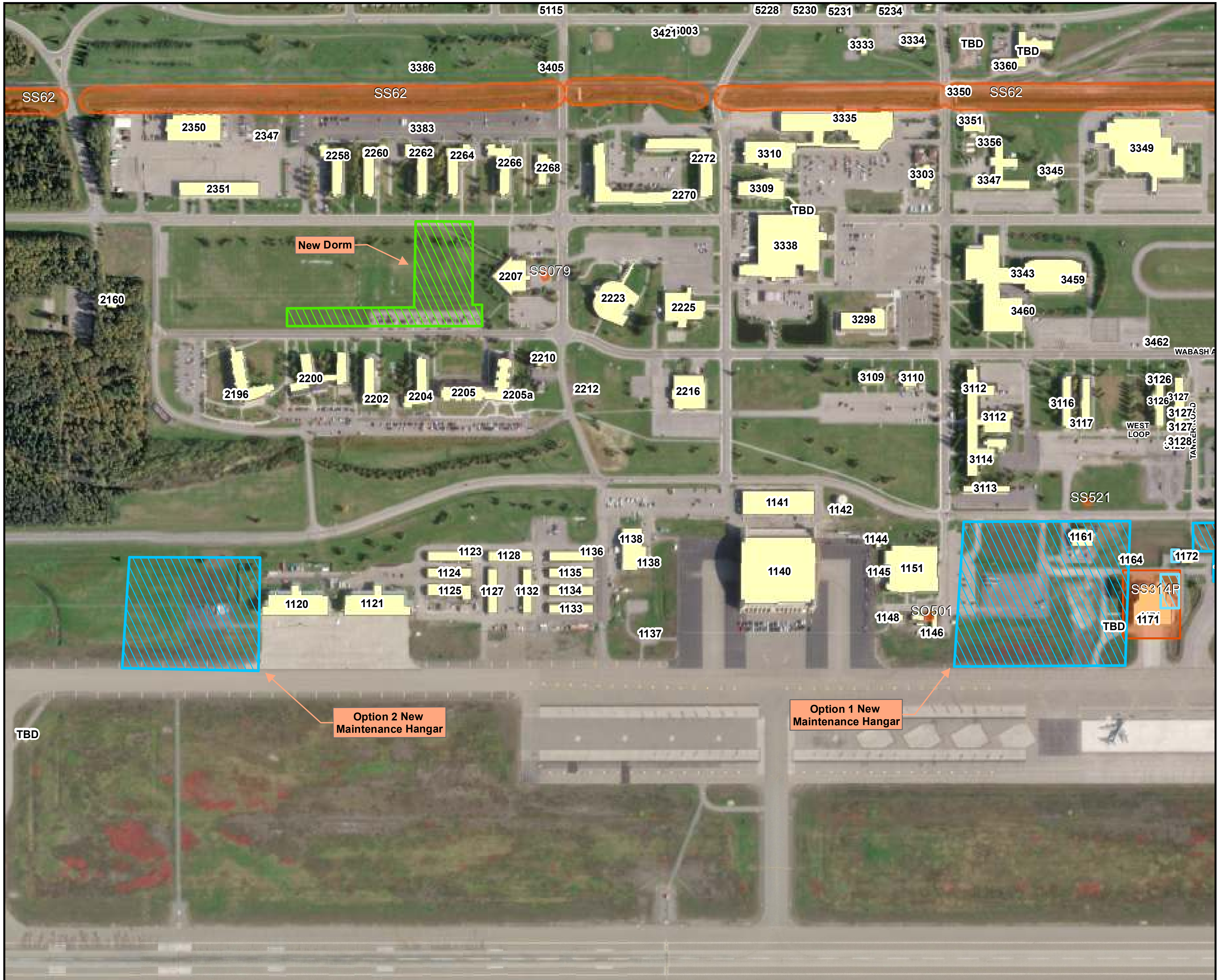

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

ENVIRONMENTAL RESTORATION PROGRAM SITES AND COMPLIANCE RESTORATION SITES WITHIN ROI - PROPOSED NEW MAINTENANCE HANGAR AND DORM AREA

Legend

- Contaminated Site
- 168 WG Parcel
- 354 FW Parcel
- Demo
- Building

New Construction
Refurbish/Renovation

Abbreviations

AGE	Aerospace Ground Equipment
CTK	Composite Tool Kit
EA	Environmental Assessment
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Notes

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ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

450 225 0 450 900
SCALE IN FEET

1 INCH

PROJECT No.: 321004	DATE: 5/13/2022	FIGURE:
P.M.: M.V.	DRAWN: C.B.	3.6-2

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A CERCLA Five-Year Review was conducted in 2017 for 37 source areas and their remedies. The Five-Year Review concluded that remedies at 28 source areas are currently protective, however, data gaps regarding contaminant delineation affect long-term protectiveness. Protectiveness determinations for nine source areas were deferred, pending an evaluation for the vapor intrusion pathway (Eielson AFB 2019a).

PFAS contamination of the aquifer beneath Eielson AFB has been identified and extends beyond the base boundary. Widespread and undelineated PFAS contamination also exists in Eielson AFB soils. PFAS compounds are known as "emerging contaminants," or chemicals with limited data on human health effects, and are ingredients found in waterproofing products, non-stick compounds, and various fire-fighting foams. PFAS contamination likely originates from historical fire-fighting foam use. Mitigation to date includes installing granular activated carbon filtration for Eielson AFB's drinking water wells and many homes in the Moose Creek community (ADEC 2020). In June 2019, the USAF, USEPA, and ADEC signed an Interim Record of Decision for Moose Creek to provide an interim remedy to protect human health by addressing the drinking water exposure pathway (USAF 2019b). The approved interim remedy is to provide a piped water system from the City of North Pole water treatment plant to Moose Creek community residents. Supply lines have been installed, a storage tank and a Moose Creek pump house have been built, and 80% of the distribution lines have been installed (ADEC 2020). Figures 3.6-1 and 3.6-2 present PFAS-contaminated sites within the ROI.

3.6.3 Environmental Consequences

The USAF has defined significance for hazardous materials and hazardous waste impacts. Impacts on or from hazardous materials and wastes may be indicators of significance if a proposed action would result in non-compliance with applicable federal or state regulations. Increases to the amounts of hazardous materials procured or hazardous wastes generated beyond current management procedures, permits, and capacities could be significance indicators. Impacts on contaminated sites may be considered significant if a proposed action would disturb or create contaminated sites, resulting in negative impacts on human health or the environment. Making it substantially more difficult or costly to remediate existing contaminated sites also could be an indicator of significance.

3.6.3.1 Proposed Action

Hazardous Materials

Long-term, minor, adverse impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes during the proposed facility construction, modifications, and demolition. Hazardous materials used may include paints, welding gases, solvents, preservatives, and sealants. Construction equipment and vehicles would use hydraulic fluids and petroleum products. Contractors would be responsible for proper management and disposal of hazardous materials and waste (e.g., secondary containment, spill kits, proper storage containers) to minimize potential for releases. Contractors would also be required to develop SPCC plans if petroleum storage for construction exceeds the threshold specified in 40 CFR 112. Construction equipment would be maintained according to the manufacturer's specification and "duck ponds" would be used under parked equipment.

Long-term, minor, adverse impacts would occur from increased use of hazardous materials and petroleum products as an effect of the Proposed Action. The addition of KC-135 aircraft would be expected to increase annual operations by a factor of 3 (PACAF 2022). There would be a corresponding increase in aircraft maintenance, and aircraft maintenance practices would not change. Additional quantities of hazardous materials and petroleum products (primarily jet fuel), would be delivered, stored, and used for operation and maintenance of the additional aircraft, and would be comparable to those used in the existing maintenance hangar, Building 1176 (Eielson AFB 2022a). The proposed addition of bulk fuel storage for 210,000-420,000 gallons of JP-8 would be documented as an amendment in Eielson AFB's existing ODPCP and submitted to ADEC for approval, in compliance with 40 CFR 112 and 18 AAC 75.415. The new bulk fuel storage would be incorporated into existing tank management programs. The bulk fuel storage tanks would be designed and constructed in accordance with state and federal regulations.

Hazardous Waste

Long-term, minor, adverse impacts would occur from increases in hazardous waste generation from the Proposed Action. Increased aircraft maintenance would generate additional hazardous waste requiring disposal. Eielson AFB's RCRA status as a large quantity generator (LQG) would not change from the anticipated increased hazardous waste generation. Hazardous waste would be expected to increase from buildings 1161, 1176, 3129, 3130, and 3133 (Eielson AFB 2021e) by a factor of 3, creating a potential, estimated increase in hazardous waste of 3,180 gallons and 10 bags of spent fluorescent lamps per year. The proposed new hangar's waste streams would be the largest addition to operational hazardous waste generation attributable to the Proposed Action; the quantity and nature of new maintenance hangar's waste streams would be comparable to the existing KC-135 maintenance hangar, Building 1176 (Eielson AFB 2022a). Additional hazardous materials storage and hazardous waste collection points would be established, as necessary. Activities would continue to comply with the HWMP, which would be modified and updated as needed.

None of the buildings affected by the Proposed Action have known ACM; therefore, no impacts are expected from ACM.

As shown in Table 3.6-2, LBP has been identified in the painted concrete at Buildings 1174 and 1176. Additionally, the age of Building 3229 makes LBP a concern, and lead sampling has not been conducted yet. LBP screening would occur at Building 3229 prior to renovation. Painted concrete would be tested for LBP prior to disposal. Any LBP waste would be handled and disposed of according to the LBP Management Plan.

Buildings would be screened for PCBs prior to renovation or demolition. Any PCB waste would be handled and disposed of according to the HWMP. Waste would be stored and disposed of appropriately. Because of the potential presence of PCBs in construction materials, solid wastes generated from demolition would need to be assessed for PCBs prior to disposal.

There would be short-term increases to the hazardous waste generated by Eielson AFB during demolition and renovation, but the increases would not affect the base's LQG status or exceed management practices, permits, and capacities for handling such increases.

Toxic Substances

Long-term, minor adverse impacts from radon and LBP are possible. The Proposed Action would entail multiple construction projects. Radon testing would be required by 354 MDG/OMRS for new construction projects after 1 year of construction. If radon survey results show levels of radon above USEPA and USAF Policy guidance levels, then newly constructed buildings may need to incorporate radon-resistant techniques to ensure safety of occupants. Radon-resistant techniques include such features as a gravel layer beneath the building slab; heavy-duty polyethylene sheeting; vent pipes; sealing and caulking openings, cracks, and crevices in and around the slab and floor assemblies; and installation of an attic vent fan (USEPA 1994, 2021c).

Contaminated Sites

Short- and long-term, minor, adverse impacts are possible due to the presence of active contaminated sites on the installation. The Proposed Action would entail at least 12 construction projects, three of which are sited in areas overlapping or adjacent to existing ERP Site WP045: (1) Refurbish/renovation: Building 1168 Maintenance Shop; (2) New construction: CTK Maintenance Facility and Parking; (3) New construction: Maintenance Admin Building.

Volatile compounds (trichloroethylene [TCE], dichoroethylene [DCE], benzene, and toluene) are the contaminants of concern (COCs) in soil and groundwater at Site WP045. Additionally, the proposed construction for OG parking is adjacent to ERP Site ST058, where benzene and lead have been identified as COCs (USAF 1995). The area of disturbance for the Building 3229 Vehicle Maintenance renovation would overlap ERP Site SS083 where GRO, DRO, RRO, VOCs, PAHs in soil have been identified as COCs.

Vapor intrusion is the migration of volatile compounds from subsurface soil or groundwater into overlying buildings. Vapor intrusion affects indoor air quality and can expose building occupants to harmful contaminants. This exposure pathway would need to be considered for new facilities constructed over site WP045 as benzene, toluene, and TCE are present in soil and groundwater. These contaminants have been identified as volatile COCs for the vapor intrusion exposure pathway (ADEC 2017).

Each new construction project would require a site-wide dewatering and hazardous soil remediation due to anticipated perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) contamination (PACAF 2021). For any construction taking place in known areas of CERCLA or PFAS contaminants, contaminated soils would require appropriate management and disposal at a permitted chemical waste landfill, or treatment to remove the contaminants. For construction taking place in areas where lead has been identified as a COC, any excavated soils would need to be sampled and analyzed for proper disposal as lead-contaminated waste in accordance with the HWMP. If a contractor unexpectedly encounters soil or groundwater that is believed to be contaminated, the contractor would be required to immediately stop work, report the discovery to USAF, and implement appropriate safety measures. Field activities would not resume in the area until the issue is investigated and resolved.

Many active contaminated sites have ongoing monitoring or active remediation, as detailed in their site-specific Decision Document or Record of Decision documents. Sites WP045 and ST058 are subject to continued groundwater monitoring and institutional controls. Site SS083 is currently under evaluation (Eielson AFB 2021m). It is not expected that the Proposed Action would have any adverse impacts to the status of these contaminated sites, or contaminated sites in the vicinity. If, during construction, renovation, or demolition, there is excavation of contamination associated with an existing contaminated site, there could be negligible to moderate beneficial impacts if gross contamination is removed.

3.6.3.2 No Action Alternative

Under the No Action Alternative, there would be no changes to the existing number of KC-135s and consequently O&M would remain unchanged. The amount and type of hazardous materials and waste handled and generated by the installation would not change from its current state. Eielson AFB would remain a permitted LQG under RCRA. Based on the general trend of augmenting base operations, it would not be expected that future changes would lead to a reduction in hazardous waste generation. Eielson AFB would likely remain an LQG, resulting in no adverse or beneficial impacts to hazardous waste.

Bulk fuel storage would remain at its current capacity until such point that increased demand necessitates additional storage. Changes to the amount of bulk fuel storage would be incorporated into the existing SPCC/ODPCP and USAF would ensure that new storage tanks are constructed, operated, and maintained in accordance with federal and state bulk oil storage regulations. Additional bulk fuel storage and handling would likely result in long-term, adverse impacts from increased risks of spills, however, adherence to state and federal requirements would mitigate most of the risk and the impacts would be negligible to minor.

3.6.4 Cumulative Impacts

The Proposed Action would coincide with the phased establishment of the F-35A program, which has an associated increase in hazardous materials usage and hazardous waste generation (USAF 2016). If implemented concurrently, the increase in air operations and fueling and maintenance associated with the Proposed Action and the F-35A program could increase the potential for minor spills and releases. O&M teams would implement BMPs to reduce the potential for spills and employ immediate cleanup response activities. Hazardous materials and wastes would be handled, stored, and disposed of in accordance with applicable regulations and approved plans. Therefore, no significant cumulative adverse impacts on the hazardous materials and wastes management system would occur.

Facility repairs, renovations, and construction projects would be expected to occur at Eielson AFB as the base continues to expand and replace or renovate aging infrastructure. Future projects may overlap geographically and/or in timing of execution with Proposed Action projects. Consequently, there could be a cumulative impact from handling, storage, and disposal of hazardous materials and waste for these projects. The Proposed Action and proposed projects would incorporate measures to limit or control hazardous materials and waste and would comply with federal, state, and local laws to ensure compliance with the use, storage, transport, and disposal of hazardous materials and wastes. Therefore, a significant cumulative impact on hazardous materials and waste would not be expected.

3.7 Biological/Natural Resources

3.7.1 Definition of Resource

3.7.1.1 Biological Resources

Biological resources include native or naturalized plants and animals and the habitats (e.g., grasslands, forests, and wetlands) in which they exist. Protected and sensitive biological resources include Endangered Species Act (ESA)-listed threatened or endangered species and those proposed for ESA listing as designated by the USFWS and the National Marine Fisheries Service (NMFS); migratory birds that are protected under the Migratory Bird Treaty Act (MBTA); and bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA).

Sensitive habitats include designated ESA-protected critical habitat and sensitive ecological areas designated by state or other federal rulings; wetlands; plant communities that are unusual or limited in distribution; and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats). Below is a detailed description of the regulatory framework used to evaluate the ROI and the potential impacts of the Proposed Action and No Action Alternatives.

Endangered Species Act (ESA)

The ESA (16 USC 1531 et seq.) establishes a federal program to protect and recover imperiled species and the ecosystems upon which they depend. The ESA requires federal agencies, in consultation with the USFWS and NMFS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The ESA also prohibits any action that causes "take" of any listed animal. To take means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Critical habitat is habitat that is essential to the conservation of threatened or endangered species. Federal agencies must ensure that their activities do not adversely modify designated critical habitat to the point that it will no longer aid in species recovery. In Alaska, the Alaska Department of Fish and Game (ADFG) maintains the State Endangered Species List and oversees the listing and recovery of special status fish and wildlife species, under the provisions of AS 16.20.190 (ADFG 2021). ADFG also completed the State Wildlife Action Plan (SWAP), which is supported through the State Wildlife Grant Program. Alaska's SWAP, the Alaska Wildlife Action Plan, is currently used by ADFG to assess the needs of species with conservation concerns, and to prioritize conservation actions and research (ADFG 2015).

Migratory Bird Treaty Act (MBTA) and EO 13186

The MBTA of 1918 (16 USC 703–712), as amended, and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, require federal agencies to conserve migratory bird populations. Unless otherwise permitted by regulations, the MBTA makes it unlawful to (or attempt to) pursue, hunt, take, capture, or kill any migratory bird, nest, or egg. Each federal agency that takes actions that could have measurable negative impacts on migratory birds is directed by EO 13186 to develop and implement a Memorandum of Understanding with USFWS to promote the conservation of migratory bird populations.

Bald and Golden Eagle Protection Act

Bald and golden eagles are protected under the BGEPA (16 USC 668-668c), which prohibits the "take" of bald or golden eagles in the United States without a 50 CFR 22.26 permit. BGEPA defines "disturb" as "to agitate or other a bald or golden eagle to a degree that causes or is likely to cause: (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition covers impacts from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

Sikes Act

The Sikes Act (16 USC 670a) applies to federal land under DoD control and, among other things, requires military services to establish INRMPs to conserve natural resources on military installations. INRMPs include inventories and evaluations of threatened and endangered species, other fish and wildlife resources, wetlands, migratory bird habitat, and forest lands on each installation. INRMPs assess the impact of military activities on natural resources and the means to mitigate these impacts. Coordination the USFWS and the ADFG ensures the INRMP complies with and supports federal and state natural resources-related laws and mandates. The INRMP includes habitat improvements or modifications, wildlife considerations in range rehabilitation, control of off-road vehicle traffic, consumptive and non-consumptive use and protection of fish and wildlife resources, natural resources law enforcement requirements, and designated responsibilities for the control and disposal of feral animals.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law that fosters the long-term biological and economic sustainability of marine fisheries in federal waters (NOAA 2007). Its objectives include preventing overfishing, rebuilding overfished stocks, increasing long-term economic and social benefits, and ensuring a safe and sustainable supply of seafood.

Marine Mammal Protection Act

Proposed activities that occur in coastal and open water areas may also be affected by the Marine Mammal Protection Act (MMPA) of 1972 (16 USC 1361 et seq.), as amended through 1997. The MMPA established a federal responsibility to conserve marine mammals and associated essential habitats in United States waters, by placing, with limited exceptions including for military readiness activities, a moratorium on the "taking" of marine mammals in waters or on lands under United States jurisdiction. Management of the MMPA is vested in the NMFS for cetaceans (whales and dolphins) and for pinnipeds (seals and sea lions) other than walrus. The USFWS is responsible for other marine mammals, including sea otter, walrus, polar bear, dugong, and manatee.

3.7.1.2 Natural Resources

Natural resources are materials from the earth that are used to support life and meet people's needs by supplying food, fuel, and raw materials to produce goods. Natural resources at Eielson AFB include water resources (wetlands, groundwater, floodplains, and surface waters, discussed in Section 3.4), gravel, coal, and training/recreational spaces.

CEQ Regulations (40 CFR 1502.16) require that federal agencies consider energy requirements, natural depletable resource requirements, and the conservation potential of alternatives and mitigation measures when evaluating a Proposed Action. Statutes and EOs related to natural resources and energy supply are found in Table 3.7-1.

Table 3.7-1 Natural Resources and Energy Supply Statutes and EOs

STATUTE/EO	DESCRIPTION
Energy Independence and Security Act	Under this act (PL 110-140), federal agencies are required to take actions to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the federal government.
Energy Policy Act	The Energy Policy Act (42 USC 13201 et seq.) requires federal agencies to take actions to ensure jobs for our future with secure, affordable, and reliable energy. The Energy Policy Act contains provisions that address energy production, including energy efficiency; renewable energy; oil and gas; coal, Tribal energy, nuclear matters, and security; vehicles and motor fuels; energy tax incentives; hydropower and geothermal energy; and climate change technology.
EO 13834	EO 13834, Efficient Federal Operations, requires federal agencies to meet energy and environmental performance statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. Agencies are tasked to prioritize actions that reduce waste, cut costs, and enhance the resilience of federal infrastructure and operations.

Notes:
For definitions, refer to Acronyms and Abbreviations section.

3.7.2 Affected Environment

The ROI includes the portion of Eielson AFB where the additional KC-135s would be housed and where the associated construction/demolition/renovation projects on the installation would occur, as well as the northern portion of the JPARC airspace used by Eielson AFB aircraft.

3.7.2.1 Biological Resources

Vegetation

Eielson AFB is located within the Yukon-Tanana Uplands ecoregion that is characterized by rounded mountains and hills of boreal forest or taiga habitats. These boreal forests are dominated by woodland evergreen species of black spruce (*Picea mariana*) and white spruce (*Picea glauca*). Large stands of deciduous forests that include balsam poplar (*Populus balsamifera*), paper birch (*Betula papyrifera*), and quaking aspen (*Populus tremuloides*) are found in boreal forests on and surrounding Eielson AFB. The on-base developed areas have been planted with native and introduced plant species and are landscaped and maintained by Eielson AFB. Installation landscaping focuses on maintaining vegetation in early stages of succession to discourage wildlife use (Eielson AFB 2016a).

In addition to Yukon-Tanana Uplands, portions of the airspace used by Eielson AFB aircraft are within the Tanana-Kuskokwim Lowlands ecoregion, which is characterized by gentle topography, patches of impermeable permafrost, and poor soil drainage. Bogs and fens and boreal, broadleaf, and coniferous forests dominate the landscape. Patterns of vegetation are determined by a variety of natural influences, including climate, topography (slope, aspect, and elevation), glaciation, flooding, depth to water table, permafrost, and fire. Forest cover is diverse and includes stands of white spruce, paper birch, quaking aspen, balsam poplar, black spruce, and spruce/hardwood, which is a mixture of the above species and predominant in lowland areas. Scrub communities are dominated by shrubs and occur at high elevations, in small stream valley bottoms, and as “pioneer” vegetation on disturbed sites, including areas recovering from fire. Vegetation in the flats is dominated by lowland bogs/fens and thermokarst forests, which consist primarily of open, stunted birch and black spruce stands. Bogs/fens are dominated by low shrubs, herbs, and sedges (USAF 2013).

Wildlife

A variety of bird, mammal, and fish species inhabit areas within the ROI. Eielson AFB is located in the Tanana Valley, which provides habitat for year-round resident bird species, as well as summer-breeding habitat for migratory bird species. Bird species occurring on Eielson AFB include the great horned owl (*Bubo virginianus*), northern goshawk (*Accipiter gentilis*), Canada goose (*Branta canadensis*) ruffed grouse (*Bonasa umbellus*), and willow ptarmigan (*Lagopus lagopus*). More than 30 mammal species have been identified at Eielson AFB including moose (*Alces alces*), black bear (*Ursus americanus*), marten (*Martes americana*), red squirrel (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus americanus*), and beaver (*Castor canadensis*). Lakes, ponds, rivers, and streams are abundant in the Tanana Valley and provide aquatic habitat for multiple fish species. Commonly observed fish species include king salmon (*Oncorhynchus tshawytscha*), rainbow trout (*Oncorhynchus mykiss*), arctic grayling (*Thymallus arcticus*), and northern pike (*Esox Lucius*) (Eielson AFB 2016a).

Detailed analyses of the major wildlife species, their ranges, and critical life cycle stages found in the terrestrial ecoregions underlying the northern portions of JPARC airspace are contained in the JPARC EIS (USAF 2013, Section 3.1.8) and are incorporated in this EA by reference. The existing information is periodically updated by the ADFG and the USFWS.

Protected and Sensitive Species

As of October 2021, there are 39 federal ESA-listed or candidate animal species and one ESA-listed plant species in Alaska (USFWS 2021a, NOAA 2021a). The State Endangered Species List currently includes two birds (Short-tailed Albatross [*Phoebastria albatrus*] and Eskimo Curlew [*Numenius borealis*]) and three marine mammals (blue whale [*Balaenoptera musculus*], humpback whale [*Megaptera novaeangliae*], and right whale [*Eubalaena*]). The five state-listed species are also listed as endangered under the federal ESA.

There are no ESA-listed threatened or endangered plant or animal species and no designated critical habitat known or expected to occur in the ROI (USFWS 2021b, 2021c, 2021d).

The Alaska Wildlife Action Plan contains a list of 138 Species of Greatest Conservation Need (SGCN) in the Central Alaska Bioregion, including fish, freshwater invertebrates, birds, amphibians, and mammals. The full list can be found on the ADFG Threatened, Endangered, and Diversity Program webpage (ADFG 2015).

Eielson AFB is located along the migratory bird Pacific Flyway, and many migratory bird species have been observed at Eielson AFB, many of which are waterfowl. MBTA-protected species that are known to Eielson AFB include lesser yellowlegs (*Tringa flavipes*) and olive-sided flycatcher (*Contopus cooperi*). Bald eagles (*Haliaeetus leucocephalus*) receive protection under the MBTA and the BGEPA. The bald eagle has been observed at Eielson AFB, though no nesting has been recorded (USFWS 2021b).

Protected species observed in the broader northern JPARC airspace include American golden-plover (*Pluvialis dominica*), bald eagle, golden eagle (*Aquila chrysaetos*), gray-headed chickadee (*Poecile cinctus lathami*), Hudsonian godwit (*Limosa haemastica*), lesser yellowlegs, and olive-sided flycatcher (USFWS 2021c, 2021d).

3.7.2.2 Natural Resources

Eielson AFB-managed lands include Eielson AFB, C Battery, Chena River Research Site, Blair Lake Active Firing Range, and Birch Lake Recreation Area. Of the 57,507 acres managed by the installation, 44,627 acres are wetlands, and 46,533 are forested (Eielson AFB 2016a). Most of the land managed by Eielson AFB is relatively undisturbed and comprised of a variety of natural resources that are typical to the broad river valleys of interior Alaska. Surface soils consist of unconsolidated silty sands and gravels, organic silts, and clays. Discontinuous permafrost occurs commonly in the upper soil layers and results in perched water lenses where wetlands are likely to form (refer to Section 3.9 for soils and soil impacts). Surface water, in the form of wetlands, ponds, lakes, and streams, occurs throughout Eielson AFB lands and dominates the landscape in the lowland areas. Much of the developed area at Eielson AFB is located within the 100-year floodplain of the Tanana River and its tributaries.

Timber

Approximately 15,553 acres of Eielson AFB are forested. Approximately 6,013 acres or 38.7% of the forested land is commercial. The commercial species are white spruce, paper birch, balsam poplar, quaking aspen, black spruce, and tamarack (*Larix laricina*). Since November 1983, Eielson AFB forests have been managed under a forest management plan or INRMP. Forest management consists of forest product sales, forest access road maintenance, and forest protection (Eielson AFB 2016a).

The forest on Eielson AFB is divided into five compartments for orderly management and administration. Each compartment is divided into timber stands. Each stand is an aggregation of trees occupying a specific area and sufficiently uniform in species composition, age, arrangement, and condition as to distinguish it from adjoining areas. Christmas tree sales, personal use firewood sales, insect and disease protection, and forest road construction and maintenance occur on Eielson AFB (Eielson AFB 2016a).

Forest resources and timber production are currently managed by the Eielson AFB Natural/Cultural Resources Section for long-term sustainability, diversity and productivity of the ecosystem considering the needs of the USAF mission and other natural resources. Current objectives include establishing a 70-year rotation age for hardwoods and a 130-year rotation age for softwoods (however, in specific instances, softwood harvest can be delayed until the trees are 200 years old); removing forested areas within the airfield height restrictions; and annually administering personal use firewood and cut-your-own Christmas tree sale programs for thinning stands (Eielson AFB 2016a).

Gravel/Topsoil/Unclassified Material

Due to a generally shallow groundwater table, artificial lakes and ponds were created on Eielson AFB during the excavation of gravel deposits for use as fill material for construction projects on-base. Lake development through gravel and topsoil extraction is still occurring at Mullins Pit and Cathers Lake (Eielson AFB 2016a).

Coal

The coal-fired CH&PP, owned and operated by the USAF, is the primary source of electrical power and heat for base facilities. The CH&PP has five burners that burn sub-bituminous coal, with an electricity production capacity of up to 25 megawatts electric (MWe) per day, though it typically produces about 10-15 MWe per day (Eielson AFB 2016b; Ellis 2021). This coal is transported by rail from the Usibelli Coal Mine, located approximately 75 miles southwest of Eielson AFB as the crow flies (Koenig 2018). A small amount of power is purchased from Golden Valley Electric Association (USAF 2016).

Petroleum

The 168 WG is the premier workhorse tanker unit of the Pacific Rim. The 168 WG aircrews annually transfer more than 17 million pounds of fuel in flight primarily to Active-Duty aircraft on operational missions (Eielson AFB 2016a) and operates 9 KC-135s as mission-critical aircraft (8 PAA and 1 Backup Aircraft Inventory) (USAF 2016).

Eielson AFB has approximately 113 aboveground fuel storage tanks and 53 underground storage tanks. A total of 166 tanks have a capacity of 500 gallons or more. The base has the bulk storage capacity for 28 million gallons of jet fuel (JP-8) and has a direct pipeline connection to a refinery located in North Pole. There is an additional 533,000 gallons in the piping inventory. The liquid fuels infrastructure is a mission critical function at Eielson AFB, and the petroleum, oil, and lubricants (POL) system is robust due to the current missions and support for F-16s, F-35As, KC-135s, AGE (such as hydraulic test stands, cargo and bomb lifts, jacking units, aircraft deicers, tractors, tugs, and other service equipment) and non-road equipment (i.e., mobile sources), such as industrial equipment, lawn and garden equipment, agriculture equipment, and recreational vehicles. Non-road equipment on Eielson AFB use diesel fuel, with the exception of riding mowers (3 units) and Polaris Ranger snowmachines (3 units) (Eielson AFB 2019b).

Training and Recreational Spaces

The USAF uses natural areas as a buffer for airfield activities while Detachment 1, 66th Training Squadron uses natural areas to conduct survival training exercises. On Eielson AFB-managed lands, there are outdoor recreation areas, natural environment areas, and areas of historical or ecological significance. With some exceptions, the outdoor recreation resources of Eielson AFB are open to the general public within the constraints of the military mission requirements for security, public health, and safety. Hunting, fishing, and trapping are allowed in accordance with federal and state hunting, fishing, and trapping regulations, seasons, and bag limits.

The outdoor recreation program is coordinated with the mission and other natural resource uses. On land used primarily for mission purposes (airfield, rifle range and impact area, ammunition storage, etc.) outdoor recreation is prohibited for safety, public health, and security reasons. On other lands the mission and outdoor recreation are compatible, however, in the event of a military exercise, outdoor recreation may be prohibited for a short time. If possible, prime outdoor recreation lands are not used for training exercises or new mission requirements. In areas used primarily for outdoor recreation (campgrounds, picnic sites, ski areas, parcours, nature trail, etc.), the use of other natural resources may be modified. Natural resources within the training areas supporting live and inert ordnance and munitions employment are managed by the U.S. Army Garrison FWA under their 2020 INRMP and the Eielson AFB 2016 INRMP (USAF 2016).

Timber cutting near recreational areas may be prohibited. Cutting, if allowed, would be restricted to selective or sanitation cuts. Buffer zones would be required around any timber sale near a recreational area. In wildlife viewing areas, trapping and/or hunting might not be allowed. Some forms of recreation may be prohibited in wildlife management areas. Mission and other natural resources use should complement rather than be detrimental to the outdoor recreational program and vice versa.

3.7.3 Environmental Consequences

The USAF has defined significance indicators for impacts to biological and natural resources to include effects to factors such as population dynamics and sustainability, alteration, destruction, or disturbance of habitat, and degree of resource consumption in comparison with availability.

3.7.3.1 Proposed Action

Biological Resources

Vegetation

The primary vegetation type within the construction zone of the ROI is previously developed, maintained grasses. The total area of vegetation disturbance would vary depending on which proposed new maintenance hangar location the USAF chooses, as the vegetation cover differs between the two locations. If Option 1 were selected, 296,157 SF (6.8 acres) of vegetation would be disturbed; if Option 2 were selected, 334,330 SF (7.7 acres) of vegetation would be disturbed. In either case, approximately 99% of the disturbed area consists of landscaped grasses, and 1% consists of black spruce, balsam fir, and shrub species. Long-term direct adverse impacts to vegetation would occur in areas where vegetation is removed to make room for new construction. Short-term direct impacts to vegetation would occur in areas where machinery and equipment are staged or operated. Impacted grass areas around the airfield have been improved or landscaped and are currently maintained on a regular basis to reduce the amount of preferred wildlife habitat and BASH potential (Eielson AFB 2021c). These areas would be re-seeded using 60-70% “Arctared” red fescue (*Festuca rubra*), 20% “Nortran” tufted hairgrass (*Deschampsia* *caespitosa*), and 10% annual ryegrass (*Lolium multiflorum*) to reduce erosion potential and discourage use by wildlife that could pose safety concerns for aircraft operations.

The proposed base improvements represent a negligible amount of habitat loss when compared to the entire unimproved areas on the installation (about 70%). Therefore, no significant adverse impacts to vegetation would occur on-base under the Proposed Action Alternative.

Wildlife

Increases in operations and overflights could result in direct adverse impacts to wildlife in areas surrounding the airfield, such as altered behavior or metabolic effects (USAF 2016). Wildlife species in areas surrounding and adjacent to airfields have historically been, and currently are, exposed to frequent human and aircraft activity, and have likely habituated to these conditions. It is anticipated that the increase in DNL noise levels and noise contour changes would be negligible under the Proposed Action; however, this increase could displace some animals. There is an abundance of similar, suitable habitat surrounding and adjacent to Eielson AFB where wildlife could move. For these reasons, the duration of adverse impacts is expected to be short-term. Displacement of wildlife to adjacent habitat would not represent a significant adverse impact to wildlife inhabiting areas that experience increased noise levels.

Wildlife species inhabiting areas surrounding building construction projects could be subject to direct adverse impacts from increases in noise level and human activity. Any such increases would be temporary and would therefore have minor impacts to wildlife in the area. Wildlife could be startled and temporarily displaced in the presence of increased noise and activity and would be expected to use adjacent habitat in such instances. Additionally, these areas are located directly adjacent to the airfield that have historically experienced high levels of human and aircraft activity, and noise. Impacts to wildlife would be short term and would not present significant adverse impacts to wildlife species.

Extensive mitigation measures, codified in the 11th Air Force Alaska Airspace Handbook, are currently in place for JPARC areas that overfly critical habitat or hatchery areas to minimize potential impacts to "at-risk" wildlife populations including Dall sheep, the Delta caribou herd, peregrine falcons, salmon, and subsistence species (USAF 2021b). These mitigations, which provide protections for wildlife species in avoidance areas, include seasonal and/or altitude restrictions and are detailed in Appendix D.1 of the USAF F-35A Operational Beddown EIS (USAF 2016). KC-135 flight operations would adhere to published airspace restrictions within JPARC (USAF 2016).

Because it is not expected that the Proposed Action would result in a decrease in species population abundance, fitness, or distribution within the region; nor in a disproportionate reduction in habitat quantity or quality; nor permanent loss of irreplaceable high-quality wildlife habitat, no significant impacts to wildlife would occur.

Protected and Sensitive Species

It is assumed that applicable flight restrictions, operations limitations, and seasonal adjustments prescribed in the 11th Air Force Alaska Airspace Handbook would continue under the Proposed Action Alternative. General noise levels within airspace used by KC-135s would negligibly increase. The number of sonic booms is not expected to increase above the No Action Alternative. A species list was requested from the USFWS via the Information for Planning and Conservation tool (IPaC) on 30 September 2021 (Appendix A). There are no listed threatened or endangered species or critical habitat present in the ROI. Therefore, the Proposed Action would not result in significant adverse impacts to ESA-listed species and consultation under Section 7 of the ESA is not required. Objective 8.5.1 of the Eielson AFB INRMP is to monitor for the presence of listed or proposed threatened and endangered species and critical habitats on Eielson AFB managed lands. Should any threatened or endangered species become resident to Eielson AFB managed lands, consultation with the USFWS would be initiated.

It is unlikely that SGCN identified in the SWAP are present where construction would occur, as this portion of Eielson AFB is heavily developed. As noted above, wildlife species in areas surrounding and adjacent to Eielson AFB have historically been, and currently are, exposed to frequent human and aircraft activity, and have likely habituated to these environmental conditions. For these reasons, no significant adverse impacts to these species are anticipated from the Proposed Action.

Bird species are known to be sensitive to disturbances during nesting season. Seven migratory bird species listed under the MBTA have the potential to occur within the diverse habitats under the northern JPARC airspace. These species are American golden-plover, gray-headed chickadee, Hudsonian godwit, lesser yellowlegs, and olive-sided flycatcher, as well as bald and golden eagles, which are also protected under the BGEPA. Habitats vary from boreal forests of spruce and hardwoods for perching birds to open-water marshes for waterfowl. Two bird species of conservation concern identified by the USFWS that may breed and nest on Eielson AFB are lesser yellowlegs and olive-sided flycatcher (USFWS 2021b).

During construction, to avoid direct adverse impacts to nesting birds, vegetation removal from suitable nesting habitat should occur outside of the nesting season, as identified by the Eielson Natural Resources Office (Eielson AFB 2016a). Once construction is completed, disturbed areas would rapidly reseed naturally, and over time would return to their pre-existing condition. Eagles are found throughout the year on-base. However, because most of the Proposed Action would occur in already developed and/or disturbed areas; the habitat to be removed is not suitable for nesting; and there is abundant habitat in the adjacent Tanana River valley to support these species, it is not anticipated that the Proposed Action would result in significant adverse impacts to these species or ground-nesting species. Under the Proposed Action, the additional KC-135s would operate in the same airspace environment as the current aircraft and flight patterns would remain unchanged. Operations occurring in northern JPARC airspace would increase by 200% over the No Action Alternative. An increase in airspace operations could result in direct mortality of birds involved in an aircraft collision; however, the potential for bird-aircraft strikes is not anticipated to be statistically different following the beddown of the KC-135s. KC-135 operations would not be expected to have a significant adverse effect on migratory bird species due to the continued implementation of the Eielson AFB BASH Plan (Appendix D).

It is anticipated that the minimal increase in BASH potential would be mitigated by the fact that KC-135 aircrews operating in the JPARC would be required to follow the permits and applicable procedures outlined in the Eielson AFB BASH Plan, and the fact that the majority of flight time is spent at higher altitudes. When BASH risk increases, limits are and would continue to be placed on low-altitude flights. Special briefings are provided to pilots whenever the potential exists for greater bird-strike risks within the airspace; KC-135 pilots would also be subject to these procedures. The USAF would continue to minimize potential adverse effects to bald and golden eagles protected under the MBTA and the BGEPA by implementing the Eielson AFB BASH Plan, using USAF tools (e.g., bird avoidance model and Avian Hazard Advisory System), and cooperating with local USDA WS.

Other actions that would be taken to avoid adverse impacts to migratory birds and/or bald and golden eagles include communication between pilots and range control personnel to reduce the risk of mid-air collisions and disturbance to migrating birds. Such protocols and adherence to the current BASH plan would continue under the Proposed Action Alternative and would help reduce any adverse impacts to migrating birds. If needed to accommodate mission requirements and subject to funding, the USAF may coordinate with the USFWS to establish habitat use models and/or conduct bald and golden eagle nest surveys to establish low flying (500 feet above ground level) areas outside of eagle habitat during the nesting season (15 March to 30 September) to comply with the BGEPA (USAF 2013).

In summary, the Proposed Action Alternative would not result in significant adverse impacts to bald and golden eagles and other migratory birds with ranges that could extend under the northern JPARC airspace, where most of the KC-135 operations would be conducted. The USAF prepared a letter to inform the USFWS of the Proposed Action and the determination of “may affect, but not likely to adversely affect” for protected avian species (Appendix A).

There is no designated Essential Fish Habitat (EFH) in the ROI; therefore, implementing the Proposed Action would not adversely impact EFH.

There are no marine mammals in the ROI (NOAA 2021b); therefore, implementing the Proposed Action would not adversely impact marine mammals.

Natural Resources

Timber

The 354 CES manages the personal use firewood program on Eielson AFB. Present demand for commercial timber includes white spruce and paper birch for fuel wood and white spruce and black spruce for Christmas trees (Eielson AFB 2016a). It is estimated that 12,229 SF (0.28 acres) of forests on Eielson AFB would be removed as part of the Proposed Action. None of this timber is managed for commercial use, and its removal would have no impact on-base timber resources. The demand for commercial timber would likely increase with the addition of 254 Active-Duty personnel and associated dependents, resulting in long-term indirect adverse impacts to timber resources. The Eielson AFB Natural/Cultural Resource Section would evaluate increased demand against the available timber supply and modify the use of this natural resource as needed per the Eielson AFB Integrated Natural Resources Management Plan. Therefore, adverse impacts to timber resources would not be significant.

Gravel/Topsoil/Unclassified Material

The Proposed Action would result in direct short-term adverse impacts to gravel resources on the installation due to the increased demand for construction materials. This would also result in direct short-term beneficial impacts to the local economy. Long-term borrow pit management, to include extraction, mowing, and wildlife, game/non-game species management, would not change, nor are borrow pit resources expected to be significantly depleted. For these reasons, the Proposed Action would not have a significant adverse impact on gravel resources.

Coal

The CH&PP boilers burn an average of 184,000 tons of coal per year (Eielson AFB 2016b). Eielson AFB rolling fuel totals for 2021 show that average coal consumption over the past 2 years (May 2019 to May 2021) was 196,733 tons per year. 2021 Coal Boiler rolling fuel totals for Eielson AFB show that, between January and August 2021, coal boiler consumption was 120,684 tons, averaging 15,085 tons per month. Since September 2003, coal consumption has not exceeded 190,000 tons per year. Usibelli Coal Mine is comprised of four active, permitted mines. Two of these, Poker Flats Mine, and Gold Run Pass Mine, are either nearing completion of coal mining or are already undergoing reclamation. The remaining two, Two Bull Ridge Mine and Jumbo Dome Mine, are actively being mined. Two Bull Ridge mining operation began in 2002 and is anticipated to produce 20 million tons of coal by 2027. Jumbo Dome Mine began actively mining in 2016 and is expected to yield 250 million tons of coal (Usibelli 2021). Indirect, long-term, adverse impacts to coal reserves are anticipated as new facilities are constructed and begin to draw power. This increase is assumed to directly correspond to the area of disturbance from proposed projects associated with the KC-135 beddown, estimated at about 6% above the existing building footprint on Eielson AFB. A 6% increase in coal use would be about 905 tons per month, or 10,861 tons per year. This represents a negligible impact on coal demand in the region. Therefore, significant adverse impacts to coal resources are not anticipated.

Petroleum

At present, KC-135 flying time on Eielson AFB is 1,300 hours annually, averaging two sorties per day. The hourly burn rate of the KC-135s is 10,000 pounds, or 13 million pounds of JP-8 annually. Under the Proposed Action, the flying time is estimated to increase by 200%, or 3,900 flight hours, resulting in a burn rate of 39 million pounds of JP-8 annually. The Proposed Action would require construction of a new

420,000-gallon fuel storage tank east of the runway and a 5,000-SF addition to the existing fuel cell hangar (Bldg 1171).

2021 Electro-Motive Diesel rolling fuel totals show that the average 12-month rolling total for diesel consumption during the 2-year period from May 2019 to May 2021 was 377 gallons. The average 12-month rolling total for gasoline consumption during the same period was 20,600 gallons.

Diesel consumption is not expected to increase significantly. The need for additional on-base equipment that uses diesel fuel (heaters, generators, and garden/commercial equipment) to support the KC-135s is not expected to increase significantly. Further, diesel is the least-used petroleum fuel at Eielson AFB, and a modest increase in demand would not represent a significant impact to demand in the area.

As of December 2018, the Eielson AFB population was 10,756 military and civilian personnel and dependents (MyBaseGuide 2021). An increase of 254 base personnel and their assumed 254 dependents would represent a 4.7% increase in population. It is reasonable to assume that gasoline consumption would increase by the same amount, or 968 gallons (representing a 12-month rolling total increase of 484 gallons per year).

The additional consumption of petroleum beyond baseline levels necessary to support increased aircraft operations because of the Proposed Action would not be expected to exceed the capacity of the refinery in North Pole or surpass established fuel consumption limits for Eielson AFB. Therefore, the Proposed Action would not have significant long-term adverse impacts on petroleum resources.

Training and Recreational Spaces

Currently there is no degradation or impairment of training and recreational spaces. A 4.7% increase in the total base population indicates a 4.7% increase in the demand for training and recreational spaces. If the additional personnel and their dependents caused user demand to exceed a particular recreation resource supply, mitigation measures would be employed: public access would be limited via a permit or user fee, or a reservation system would be established to control and disperse use over the resource base. If available, additional resources would be developed to meet the demand (Eielson AFB 2016a). Such development would be evaluated in a separate NEPA analysis, if necessary. For these reasons, the Proposed Action is not anticipated to have significant long-term adverse impacts to training and recreational spaces.

3.7.3.2 No Action Alternative

Under the No Action Alternative, no additional KC-135s and associated personnel would be assigned to the installation. None of the proposed facility and infrastructure construction projects, renovation/repair projects, or facility demolition projects would be implemented.

Biological Resources

It is presumed that over time, limited construction would occur within previously developed areas on the installation. There would be no changes in aircraft numbers or to existing aircraft operations within northern JPARC airspace. No habitat would be disturbed, and changes to the baseline noise environment would be temporary and short-term, resulting in negligible direct adverse impacts to wildlife. Impacts to nesting birds are not anticipated; however, if vegetation were removed from suitable nesting habitat, procedures for minimizing bird impacts such as removing trees outside of the nesting season would be identified and communicated to the appropriate personnel by the Eielson Natural Resources Office. No protected or sensitive species would be adversely affected, as there are no listed threatened or endangered species or critical habitat present in the ROI, and it is unlikely that SGCN identified in the SWAP would be present during construction, as such activities would occur on previously developed portions of Eielson AFB that do not contain suitable habitat. Vegetation in developed areas of Eielson AFB, where construction would likely occur, consists mostly of grassy areas that have been improved or landscaped and are regularly maintained. Impacted areas would be re-seeded with approved seed mixes, and direct adverse impacts would be short-term and negligible. For these reasons, no significant adverse impacts to biological resources are anticipated from implementing the No Action Alternative.

Natural Resources

The demand for natural resources such as timber, gravel, coal, and petroleum products would remain at baseline levels, which currently do not exceed and are not anticipated to exceed supply. It is presumed that on-base improvements would continue regardless of whether the Proposed Action were implemented. Any new construction would result in an increase in demand for natural resources.

Increased timber demand would directly affect timber supply; adverse impacts to timber resources on Eielson AFB would be mitigated by the USAF to the extent practicable through forestry techniques established in the INRMP and would not be expected to be significant in the long-term.

Extraction from borrow pits would continue gradually until supplies are depleted. While this is an adverse impact, it would be short-term and moderate, as it would not represent a significant impact to overall supply in the area. The USAF would consider alternative methods for obtaining gravel, topsoil, and unclassified materials for construction, such as alternate sources on the installation and local suppliers. If the latter option were pursued, this would result in a significant long-term beneficial impact to the local economy. Significant long-term adverse impacts to construction material supplies are not anticipated.

Coal reserves are plentiful in central Alaska, and it is not anticipated that future on-base improvements would drive the demand for this resource beyond the supply for this resource; therefore, while minor long-term adverse impacts to coal are anticipated, they would not be significant.

Diesel is mainly used for non-road vehicles and equipment on Eielson AFB. While diesel fuel consumption is expected to increase over time, there is no reason to believe that the demand could not be met by suppliers in the area. The same is true for gasoline and JP-8 fuel. Therefore, significant long-term adverse impacts to petroleum supplies are not expected.

It is unlikely that there would be an increase in base personnel to a degree that the demand for training and recreational spaces would adversely impact these resources. If this were to occur, additional facilities would be constructed, or existing spaces would be reorganized; therefore, significant long-term adverse impacts to training and recreational spaces are not anticipated. For these reasons, there would be no significant adverse impacts to natural resources from the No Action Alternative.

3.7.4 Cumulative Impacts

3.7.4.1 Biological Resources

Noise associated with proposed projects and other planned actions at Eielson AFB would generally have direct, minor, short- term, cumulative adverse impacts to wildlife from disturbance during construction and demolition, and would be greatest for simultaneous construction projects occurring in the same general vicinity. Mortality of small, less-mobile species (e.g., small mammals) could occur from collisions with heavy equipment. When effects from planned projects are considered cumulatively, it is not expected that there would be long-term substantial reductions in species populations, given that development would occur in areas that have already been disturbed and where wildlife habitat is marginal. Increased operations within existing airspace would have long-term impacts if wildlife begin to completely avoid these areas, which has not been observed to date. A majority of the affected areas on-base currently contain low-quality habitat for common species. For these reasons, significant adverse cumulative impacts to wildlife are not expected.

3.7.4.2 Natural Resources

Timber harvest demand may increase over time with the addition of Active-Duty personnel and their dependents. This represents a long-term adverse impact on timber resources and potentially on the scenic qualities of recreational areas on the installation; however, this would be mitigated by modifying the INRMP to maintain productivity while also following Alaska Division of Forestry guidelines for rotation age and maintaining the scenic beauty of recreational areas on Eielson AFB.

As base population increases, base improvements and developments are expected to increase. Naturally occurring construction materials such as gravel, topsoil, and unclassified material from existing borrow pits would be drawn from when possible. Over time, this demand many exceed the available supply on-base. It may then be feasible to consider creating new borrow pits, revisiting historic borrow pits, or ceasing to gather materials from on-base. The decision would take USAF objectives into consideration while weighing them against the potential for adverse effects to the environment. There are numerous commercial sources of these materials within the vicinity of Eielson AFB, and the nature of the unconsolidated materials in the Tanana River and Chena River floodplain is such that regional availability is not a concern. It is not anticipated that the Proposed Action would significantly contribute to cumulative adverse impacts to natural resources by exceeding the supply of active borrow pits.

Coal usage would presumably rise with the addition of 254 personnel and dependents, not only due to the increase in per capita use, but also from the construction and operation of new facilities associated with the Proposed Action. Taken together with presumed future construction in previously developed areas, it is anticipated that these projects would cumulatively result in a long-term increase in coal reserve demand. In addition to its active mines, which represent a combined yield of 270 million tons of coal, Usibelli Coal Mine has two future reserves, Rosalie Mine and Wishbone Hill Mine. These are not actively being mined but are in the permitting or feasibility phase (Usibelli 2021). It is not anticipated that Proposed Action, in conjunction with other future projects on the installation, would contribute to a cumulative increase in coal demand beyond the capabilities of the Usibelli Coal Mine to supply.

Like coal, petroleum usage on Eielson AFB would be expected to rise with the influx of personnel; particularly the demand for gasoline for personal-use vehicles and JP-8 to support the new KC-135s. Because KC-135 operations follow predictable schedules and flying patterns, the expected increase in jet fuel demand is easily calculable and the Proposed Action includes measures to accommodate this increase. Future actions requiring additional readily available JP-8 would be assessed individually prior to implementing. Gasoline use would likely increase by about 4.7% keeping pace with the base population increase. Diesel use would not be expected to change significantly, as the need for equipment that uses diesel fuel is not anticipated to increase, or negligibly if so. Demand for diesel and gasoline would presumably increase over time as the base population continues to grow; however, this would not be expected to present a significant drain on available petroleum resources in Central Alaska.

Demand for training and recreational spaces would likely both increase with an addition of personnel and non-DoD dependents. As this is a finite number, the increased demand would not be expected to accumulate beyond the scope of the analysis in Section 3.7.3.

The 2019 National Defense Authorization Act (NDAA) required the Secretary of Energy to report on a pilot program to provide resilience for DoD facilities by contracting with a commercial entity to build and operate at least one licensed nuclear micro-reactor by 31 December 2027 (USAF Office of the Deputy Assistant Secretary for Environment, Safety, and Infrastructure [SAF/IE] 2021a; Conca 2021). EO 13972, Promoting Small Modular Reactors for National Defense and Space Exploration, outlined requirements for micro-reactor development specifically within the DoD. In October 2021, the AF announced Eielson AFB as the installation to pilot its first micro-reactor. Eielson AFB was selected in part due to its resilient power needs for mission assurance, limited access to clean energy, existing energy infrastructure, and compatible climate. Construction of the new micro-reactor is anticipated to begin in 2027(SAF/IE 2021a; SAF/IE 2021b). The micro-reactor project is not connected to the Proposed Action; however, because the project is planned to occur in the ROI in the next five years, the potential cumulative impacts to natural resources from both the Proposed Action and the micro-reactor project are analyzed in this section.

The micro-reactor would be commercially owned, operated, licensed by the U.S. Nuclear Regulatory Commission (Eielson AFB 2021o). Components of the micro-reactor would be assembled in a factory and shipped out to siting locations via truck, shipping vessel, airplane, or railcar. Although the exact micro-reactor design has not yet been selected as of April 2022, most micro-reactor designs are powered by uranium-235 (U.S. Department of Energy 2021). There would be no demand on natural resources in the ROI. The micro-reactor technology for the pilot is expected to produce 1-5 megawatts thermal (MWt) per day that could be used directly as heat or converted to electric power to supplement current installation energy sources as a redundant resilience measure. This energy resilience would be provided without additional dependence on fossil fuels. The reactor would only serve the installation and would not be connected to the commercial grid; however, should the asset ever be connected to the grid, its relatively small scale would not disrupt coal plant demand (SAF/IE 2021b). In total, significant adverse cumulative impacts to available natural resources are not expected.

3.8 Cultural Resources

3.8.1 Definition of Resource

The term "cultural resources" refers to tangible remains and material evidence resulting from past human activity and/or specific locations of traditional importance. Cultural resources include prehistoric and historic archaeological sites, structures, buildings, districts, landscapes, or other locations or objects determined important for scientific, traditional, religious, or societal reasons. This includes Native American and Alaska Native sacred sites and Traditional Cultural Properties (TCPs).

Potential cultural resource impacts are addressed by Section 106 of the NHPA (54 USC 300101 et seq.), which requires federal agencies to consider effects to "historic properties" from an undertaking. Historic properties are defined (54 USC 300308) as cultural resources that are either listed, or eligible for listing, in the National Register of Historic Places (NRHP). The cultural resources discussed in this chapter include those that meet the specific criteria of the NHPA and associated regulations. The Section 106 process is set forth in 36 CFR 800 "Protection of Historic Properties." Per AFI 32-7065 and 36 CFR 800.8, Eielson AFB coordinates NEPA compliance with its NHPA responsibilities to ensure that historic properties and cultural resources are given adequate consideration during project planning. This analysis incorporates NHPA Section 106 review into the NEPA process.

3.8.2 Affected Environment

As defined under 36 CFR 800.16(d), the area of potential effect (APE) is the geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The APE is determined by the scale and nature of the undertaking and may be different for different kinds of effects caused by project activities. For the purposes of this analysis, the term APE is synonymous with ROI.

The USAF has defined the APE for direct effects as specific areas of disturbance associated with proposed facility construction, demolition and renovation as shown in Figures 2.1-1 and 2.1-2. For architectural resources the APE includes a buffer to account for auditory or visual impacts. The APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active air force base, this buffer should capture locations from which individual project construction or demolition may be visible or audible. As there would be no change to airspace use or flight patterns from the Proposed Action, the APE for this analysis does not include airspace (see USAF 2013 and USAF 2016 for detailed analysis and discussion of airspace impacts for planes operating out of Eielson).

3.8.2.1 Archaeological Resources

Gerlach, Bowers, McIntosh, and Mason completed an intensive archaeological survey of Eielson in 1996 (Eielson AFB 2019c). Their efforts included developing a predictive model, intensive systematic pedestrian survey, and subsurface testing including 2,192 soil probes, 465 shovel tests and several 1- by 2-meter excavation units. Despite these extensive efforts, no archaeological remains or other physical evidence of prehistoric or non-military historic land use by Athabaskans or Euroamericans was identified. Based on these results, "Eielson AFB has effectively met inventory responsibilities and obligations regarding the identification and assessment of significant archaeological and prehistoric resources" (Eielson AFB 2019c: 55), and the APE contains no known archaeological sites.

3.8.2.2 Architectural Resources

Several building evaluations have been completed at Eielson AFB (e.g., Maggioni and Bowman 2018; McCroskey 2002, 2004a, 2004b; Eielson AFB 2019c; USAF 2016). There is one historic district identified in the main base. Adjacent to the Proposed Action's APE is the Eielson AFB Flightline Historic District, which consists of 19 contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS) – the statewide database of cultural resources maintained by the Alaska Office of History and Archaeology (OHA) (Alaska Department of Natural Resources OHA 2021). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to national strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as NRHP-eligible under Criteria A and G, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019c).

Two additional historic districts have been identified at the base: (1) the Quarry Hill Munitions District (AHRS site FAI-01766); and (2) the Engineer Hill Munitions District (AHRS site XBD-00233). These munitions storage facilities were associated with Cold War strategic bomber response and rapid deployment. They are both managed under the Program Comment for World War II and Cold War Era (1939 to 1974) Ammunition Storage Facilities between DoD and the Advisory Council on Historic Preservation (ACHP 2006). Quarry Hill is 3 miles away from the APE; Engineer Hill is 6 miles distant.

No other buildings older than 50 years have been identified as NRHP-eligible. Of the buildings at Eielson AFB dating to the Cold War era that are younger than 50 years, none appear to have the exceptional significance necessary to achieve NRHP eligibility (Eielson AFB 2019c).

3.8.2.3 Traditional/Alaska Native Resources

Six federally recognized Tribes may have ancestral ties to Eielson AFB lands: (1) Healy Lake Village; (2) Northway Village); (3) Village of Dot Lake; (4) Native Village of Tanacross; (5) Native Village of Tetlin; and (6) Nenana Native Association. In accordance with EO 13175, DoD Instruction 4710.02, and AFI 90-2002, the USAF consulted with these Tribes on a government-to-government basis, and as part of the Section 106 process. Additional Alaska Native organizations coordinated with include Doyon, Limited, the Tanana Chiefs Conference, and the Fairbanks Native Association. Table 5-1 has a list of these organizations. Appendix A provides consultation correspondence. No TCPs, Sacred Sites, or sites of traditional cultural importance have yet been identified on Eielson AFB.

3.8.3 Environmental Consequences

Impacts to cultural resources can occur by physically altering, damaging, or destroying a resource or by altering characteristics of the surrounding environment that contribute to the resource's significance. Direct impacts entail physical changes to a historic property. Indirect effects usually occur through increased use, visual disturbance, or noise.

To evaluate impacts, historic properties are subject to the criteria of adverse effect found at 36 CFR 800.5. An adverse effect to historic properties occurs when an undertaking or action alters, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP. Adverse effects can include: (1) physical destruction of or damage to all or part of the property; (2) alteration of a property, including restoration, rehabilitation, repair, maintenance, and stabilization; (3) removal of the property from its historic location; (4) change of character in the property's use or of physical features within the property's setting that contribute to its historic significance; and (5) introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features. If an undertaking directly or indirectly affects a property in a manner that does not permanently alter its integrity or NRHP eligibility, then it is not considered an adverse effect. The USAF defines an adverse effect as an indicator of a significant impact.

3.8.3.1 Proposed Action

The Proposed Action would result in no direct adverse impacts to architectural resources that qualify as historic properties. Table 3.8-1 lists the NRHP status of facilities that will experience additions, alterations, or demolition as part of the action, all of which were built in the past 35 years. None rise to the level of exceptional significance required for NRHP eligibility for properties less than 50 years old (see NPS 1997, 1998). None is a contributing element to the Flightline Historic District (Eielson AFB 2019c). Modifications to, or demolitions of, these buildings would not constitute direct effects to historic properties.

Table 3.8-1 NRHP Status of Facilities Proposed for Additions/Alterations/Demolition

BUILDING NUMBER	AHRS NUMBER	YEAR BUILT	NRHP ELIGIBILITY
1168	NA	1998	Not Eligible
1171	FAI-00671	1997	Not Eligible
1172	FAI-00672	1996	Not Eligible
1173	FAI-00673	1996	Not Eligible
1174	FAI-00674	1990	Not Eligible
3129	FAI-00780	1995	Not Eligible
3229	FAI-00790	1987	Not Eligible
De-icer tank (6260)	FAI-02494	1954	Not Eligible

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

As shown in Table 3.8-2, for most development associated with the Proposed Action, the nearest contributing element is Building 1183, the Squadron Operations Building listed with the AHRS as site FAI-00679. While construction and demolition associated the Proposed Action could be seen and heard from these nearby historic properties, noise and visual impacts would be minor and temporary. They would not permanently affect integrity or characteristics that make the buildings or the Flightline District eligible for inclusion on the NRHP. Setting and feeling would remain consistent with that of an active military base and would not be adversely impacted. Land use setting would remain consistent with intended use on a military facility. Thus, while there might be minor, short-term, temporary construction auditory and visual effects to Eielson Flightline Historic District contributing elements from the Proposed Action, these would not be considered significant.

Table 3.8-2 Historic Properties within 1,000 Feet of Proposed Action Projects

PROJECT	NEAREST HISTORIC DISTRICT CONTRIBUTING ELEMENT/HISTORIC PROPERTY	DISTANCE (FEET)
Bldg 1168 addition (Maintenance)	Bldg 1183 (FAI-000679)	120
Bldg 1171 addition/renovation (Fuel Cell Hangar)	Bldg 3112 (FAI-00769)	950
Bldg 1172 addition/alteration (AGE Warm Storage)	Bldg 3112 (FAI-00769)	975
Bldg 1173 demolition (Tug & De-icer Warm Storage)	Bldg 1183 (FAI-00679)	850
Bldg 1174 demolition (Refueling Pump Station)	Bldg 1183 (FAI-00679)	715
Bldg 3129 addition/renovation (Squad Ops)	Bldg 1183 (FAI-00679)	810
Bldg 3229 addition (Fuel/Fire Vehicle Maintenance)	Bldg 1183 (FAI-00679)	690
Construct Aerospace Ground Equipment Warm Storage	Bldg 3112 (FAI-00769)	900
Construct 9-Bay Vehicle Storage	Bldg 1183 (FAI-00679)	700
Construct Maintenance Administration Bldg	Bldg 1183 (FAI-00679)	350
Construct CTK Maintenance Facility	Bldg 1183 (FAI-00679)	350
Construct OG parking area	Bldg 1183 (FAI-00679)	762
Construct 96-man Dormitory*	None	NA
Construct 96-man Dormitory Parking*	None	NA
Construct 96-man Dormitory Fire Lane*	None	NA
Construct 420k-gallon Fuel Receipt Tank*	None	NA
De-icer tank repair/replacement*	None	NA
Construct Maintenance Hangar (Option #1)	Bldg 1146 (FAI-00663) Bldg 3112 (FAI-00769) Bldg 1141 (FAI-00659) Bldg 1140 (FAI-00658)	75 70 690 700
Construct Maintenance Hangar (Option #2)	Bldg 1120 (FAI-00642) Bldg 1121 (FAI-00642) Bldg 1125 (FAI-00646) Bldg 1124 (FAI-00645) Bldg 1123 (FAI-00644)	50 385 780 785 790

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
*No Historic Properties or Historic District contributing elements are within 1,000 feet.

No historic properties are within 1,000 feet of the dormitory construction site, the new fuel tank site, or the deicer replacement site. The dormitory site in the main base area has been surveyed and inventoried. No historic properties are nearby, and the site is an area of previous construction disturbance. The new fuel tank will be constructed at the Eielson POL storage facility which was surveyed and evaluated in 2018. Existing tanks and other nearby associated facilities were determined not eligible for the NRHP either individually or as a district, with SHPO concurrence (Bittner 2019; Maggioni and Bowman 2018). While the deicer tank (FAI-02494) was built in 1954, it was surveyed and evaluated in 2018. The deicer tank, and nearby associated facilities at the Eielson POL facility, were determined not eligible for the NRHP either individually or as a district, with SHPO concurrence in 2019 (Bittner 2019; Maggioni and Bowman 2018).

The Proposed Action would not be expected to significantly impact archaeological or traditional resources because no such properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan (ICRMP).

No significant adverse impacts to cultural resources are expected from the Proposed Action. Under Section 106 of the NHPA, Eielson AFB consulted with the Alaska SHPO, which concurred with the finding of no adverse effect on historic properties (Appendix A).

3.8.3.2 No Action Alternative

Under the No Action Alternative, the proposed projects would not be implemented, and as a result, no cultural resources would be impacted. The general trend of base development would likely continue, and USAF would continue to construct, renovate, and demolish facilities as aging infrastructure is replaced or upgraded to meet evolving needs. USAF would continue to comply with NHPA Section 106 process, the regulations set forth at 36 CFR 800, procedures in AFI 32-7605, and standard operating procedures in the Eielson AFB ICRMP for these types of projects; therefore, no adverse effects to cultural resources are expected from implementation of the No Action Alternative.

3.8.4 Cumulative Impacts

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or damage to historic properties may incrementally impact cultural resources in the region.

No significant adverse impacts to cultural resources would be anticipated from the Proposed Action. Past actions have been conducted in accordance with Section 106 of the NHPA to mitigate adverse effects. Any present and/or future actions also require implementation and completion of the Section 106 process. Future actions that involve historic properties at Eielson AFB include renovations to Building 1120 (FAI-00642), to include interior modifications and potentially exterior modifications such as hangar door replacement and adding an exterior egress staircase.

If adverse effects to cultural resources are anticipated from these proposed projects, or other actions, adherence to the NHPA Section 106 process, the regulations set forth at 36 CFR 800, procedures in AFI 32-7605, and standard operating procedures in the Eielson AFB ICRMP would be followed to mitigate these impacts. Similarly, if adverse effects are anticipated to occur to resources outside of Eielson AFB, and the project is considered a federal undertaking, compliance with the Section 106 process in the NHPA would also be required, with the procedures codified at 36 CFR 800 to mitigate adverse impacts. If the Section 106 process is followed during individual projects, any potential adverse impacts would be resolved and, as a result, no adverse impacts to cultural resources would be anticipated. As there are no identified adverse impacts to cultural resources from the proposed projects, and by adhering to the Section 106 process for other actions, no cumulative impacts would be expected for cultural resources. Significant cumulative adverse impacts would not occur.

3.9 Earth Resources

3.9.1 Definition of Resource

Earth resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources are often described as presented in Table 3.9-1.

Table 3.9-1 Earth Resources Descriptors

DESCRIPTOR	DEFINITION
Topography	The relative positions and elevations of natural and fabricated features at the earth's surface.
Geology	The distinctive, dominant, and recognizable physical characteristics and features of a volume of rock.
Soils	The unconsolidated earthen materials overlying rock.
Geologic Hazards	Adverse geologic conditions capable of causing damage or loss of property and life, including seismic activity.

The Farmland Protection Policy Act (FPPA) requires that federal agencies identify and consider the adverse effects of their programs on the preservation of farmlands (7 CFR 658). The FPPA applies to farmland defined as "prime" or "unique" in Section 1540(c)(1) of the Act, or to farmland or soils of statewide or local importance as defined by the appropriate state or local agency.

3.9.2 Affected Environment

Eielson AFB is in the Tanana River Valley and lies east of the Tanana River. The base is located on the floodplain of the river with elevations ranging from 525 to 550 feet. The area is generally level, sloping downward to the northwest at a gradient of approximately 6 feet per mile.

Geologically, the Yukon-Tanana Terrane comprises most of the Tanana River Valley. This terrane extends from west of Fairbanks, Alaska eastward to the Yukon Territory of Canada and is the oldest rock known to occur in interior Alaska. Precambrian metamorphic rocks, including muscovite-quartz schist, micaceous quartzite, and graphitic schist, are found in this area.

Soils in the Tanana River Valley consist of unconsolidated silts, sands, and gravels of alluvial origin (USDA-Natural Resources Conservation Service (NRCS) 2021c). Floodplain soils nearest the active river channel are sandy or gravelly, with a thin silt loam layer on the surface. Terraces of the floodplain further from the active river channel may also have caps of silt loam or very fine sandy loam of eolian origin. Permafrost soils contribute to the large percentage of vegetated wetlands occurring Tanana River Valley. Hydric soils in the area contain significant amounts of organic matter and are generally underlain by shallow permafrost. Though discontinuous permafrost occurs in the vicinity of Eielson AFB, the installation's developed area is essentially free of near-surface permafrost. Construction fill used in the development of the base and airfield has been built up to a thickness of 3 to 8 feet, providing a foundation for construction that is generally well-drained and separated from permafrost.

In terms of geologic hazards, Alaska rates as one of the most seismically active areas in North America, with an earthquake detected once every 15 minutes on average (Alaska Earthquake Center 2020). The Denali Fault located at the southern boundary of the Yukon-Tanana Terrane, and numerous smaller faults in the Tanana River basin, are the source of most earthquakes in the region surrounding Eielson AFB. In the past 110 years, three magnitude 7 earthquakes have occurred within 50 miles of Fairbanks, Alaska (Haeussler and Plafker 2004).

The majority of the ROI is located on a terrace within the Tanana River floodplain that lies outside of the 100-year floodplain; approximately 28% of the ROI lies within the 100-year floodplain (FEMA 2014). Soil map units in the ROI outside the 100-year floodplain are well-drained and have a flooding frequency of none to rare (USDA-NRCS 2021c). In its current state, soils are non-hydric and no wetlands have been mapped in the ROI. The developed portion of Eielson AFB, including the affected area, is composed of both natural soils and fill material deposited atop reclaimed wetlands. The natural soils have a solum of very fine sandy loam or silt loam and are classified as the Jarvis or Salchaket series. The fill material is comprised of poorly sorted Tanana floodplain gravels, cobbles, and other soil materials classified as either Urban Land or Typic Cryorthents. Based on NRCS soil survey information, all soil types within the affected area other than Urban Land are classified as "soils of local importance" (USDA-NRCS 2021c).

3.9.3 Environmental Consequences

Impacts to earth resources are evaluated on their potential to affect the topography and flooding of the ROI. The USAF has defined significance indicators for earth resources impacts as the loss of prime or unique farmland, or farmland of statewide or local importance.

3.9.3.1 Proposed Action

The Proposed Actions would disturb approximately 8.68 acres of land within the Eielson AFB property. The Proposed Action would not significantly alter the topography of the ROI, or otherwise affect the flooding frequency or intensity in the ROI. It is extremely unlikely that the Proposed Action would create any new geologic hazards or exacerbate or affect existing geologic hazards.

The soil resource in the ROI, however, would be negatively affected by the Proposed Action. No soils in Alaska have been recognized at the federal or state level as prime farmland, unique farmland, or farmland of statewide importance; however, soil map units 363 (Jarvis-Salchaket complex) and UC (Urban Land-Typic Cryorthents complex) on Eielson AFB are both classified as "farmland of local importance" (USDA-NRCS 2016, 2021a, 2021b). Though its current use as an AFB may prevent agricultural use of soils, the agricultural potential of the soil resource would be negatively affected by the Proposed Action, reducing the acreage of soil with agricultural potential. However, adverse impacts to soils of local importance resulting from the Proposed Actions are considered minimal due to the land being reserved for military use for the foreseeable future; the ROI is largely already developed/disturbed land; and the undisturbed land in the ROI is small compared to the total acreage of these soils within the greater Fairbanks-North Pole area.

There is potential to encounter contaminated soil during construction, renovation, and demolition projects due to the proximity of several active contaminated sites within the ROI. Management and disposal of contaminated soils is discussed in Section 3.6.3.1.

3.9.3.2 No Action Alternative

Under the No Action Alternative, construction, demolition, and renovation projects associated with the Proposed Action would not occur, leaving the geology, topography, and soils in the ROI unchanged when compared to existing conditions. Development of areas on-base would continue in the future as base operations change and expand, and as aging facilities are replaced or upgraded. Future developments would likely have adverse effects on the soil resource in the ROI, as they would reduce the amount of soils with agricultural potential. However, as described previously, these adverse impacts would be considered minimal due to the military nature of installation land use, which precludes agricultural use, and the fact that land in the ROI has largely already been developed. Consequently, these effects would be minor in nature.

3.9.4 Cumulative Impacts

Previous development projects in the ROI of Eielson AFB have filled in wetlands to establish the airfield, and constructed roads, parking lots, and structures on soils that could be considered "farmland of local importance." Additional construction projects in the vicinity are reasonably foreseeable due to changing and expansion of base operations, including those associated with the Proposed Action. This would continue the trend of natural soils development (e.g., Jarvis and Salchaket soils) in areas of the base that have previously been cleared of vegetation but not substantially altered. Furthermore, past practices and handling of hazardous materials have contributed to contamination that has adversely affected soil quality in some localized areas within the ROI. The cumulative effects of these soil disturbances extend beyond the immediate project construction boundaries and reduce the available agricultural soils in the ROI. However, with or without the Proposed Action, it is highly unlikely that the affected area would be used for agriculture. The established use of this area as a developed, industrialized zone and the already discontinuous areal extent of the agricultural soils inside of the AFB boundary make the potential cumulative impacts minor and long-term in nature.

3.10 Socioeconomic Resources/Environmental Justice

3.10.1 Definition of Resource

CEQ regulations implementing NEPA state that when economic or social effects and natural or physical environmental effects are interrelated, these effects on the human environment should be analyzed (40 CFR 1508.14). Factors that characterize the socioeconomic environment represent a composite of several interrelated and non-related attributes. Indicators of economic conditions for a geographic area can include demographics, median household income, unemployment rates, employment, and housing. Employment data identify employment by industry or trade and unemployment trends. Data on personal income in a region are used to compare the effects of jobs created or lost as a result of a proposed action. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Changes in demographic and economic conditions are typically accompanied by changes in other community components, such as housing availability, education, and the provision of installation and public services, which are also discussed in this section.

Analysis of environmental justice evaluates impacts on minority, low-income, elderly, and child populations (USEPA 2014). Two EOs deal directly with concerns of potentially affected communities. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. EO 12898 was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, tribal, and local programs and policies. EO 12898 requires each federal agency to identify and address whether their proposed action results in disproportionately high and adverse environmental and health impacts on low-income or minority populations. EO 13045, Protection of Children from Environmental Health Risks and Safety Risks requires a similar analysis for children. According to The USAF Guide for Environmental Justice Analysis under the Environmental Impacts Analysis Process, another sensitive population needing evaluation for potential adverse health effects generated by a proposed USAF action is the elderly (USAF 2014).

Minority populations are "identified where either: (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis" (EO 12989). Minorities include Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi race that includes one of the aforementioned races. The Census considers race and Hispanic or Latino origin (ethnicity) as distinct; these data are recorded separately. Low-income populations are identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty (EO 12989). Children are people 17 years of age and under, while elderly are people 65 years of age and over.

3.10.2 Affected Environment

The ROI for socioeconomics is defined as the geographical area within which the principal direct and secondary socioeconomic effects of actions associated with the Proposed Action would likely occur and where most consequences for local jurisdictions would be expected. The ROI for socioeconomic and environmental justice impacts analysis is the FNSB, which contains the city of Fairbanks, the city of North Pole, Eielson AFB and surrounding areas, and comprises of census tracts 1-19. For comparative purposes and context, additional statewide data are provided.

3.10.2.1 Population

Based on Census data, the population of the ROI in 2020 was 95,655, which represents a 15.5% increase since 2000. Within the ROI, the City of Fairbanks grew at a much smaller rate (7.6%) during the same period, while the City of North Pole grew at a significantly higher rate of 34.5%. Alaska's population increased 17%, a similar level of growth to the ROI, during the same period (Census 2021a, 2021b, ADOLWD 2021a). Table 3.10-1 shows the total populations for 2000, 2010, and 2020 for the ROI (FNSB), municipalities within the ROI (Fairbanks and North Pole), and Alaska as whole.

Table 3.10-1 Population in ROI, Municipalities, and State of Alaska

GEOGRAPHIC AREA	2000	2010	2020	PERCENT CHANGE 2000-2020
FNSB	82,840	97,581	95,655	15.5
City of North Pole	1,590	2,117	2,139	34.5
City of Fairbanks	30,214	31,535	32,515	7.6
Alaska	626,932	710,231	733,391	17

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: Census 2021a, 2021b, ADOLWD 2021a

The most recent workforce population data was in 2018 at which time the base's population was 10,756 military and civilian personnel and dependents. Total employment at the base during 2018 consisted of 6,326 personnel, including 1,797 active-duty military personnel, 648 Air National Guard members, and 3,881 civilian employees. Of the military members assigned, there were 2,236 associated dependents (MyBaseGuide 2021, Eielson AFB 2018a). Eielson's population grew 27% in the first half of 2020 as nearly 950 people moved in during the first quarter alone. By March 2021, the base's population had grown to 2,894 active-duty personnel, and 3,270 military family members (FNSB 2021). As of September 2021, the base's active-duty population has grown to 2,981 personnel – a 65% increase since 2018. The base's active-duty population is expected to rise to 3,232 personnel at the completion of F-35A stationing in FY 2022 (Eielson AFB 2021h).

3.10.2.2 Economic Activity

Table 3.10-2 shows the regional employment by industry in the ROI and Alaska. The total number of employed people in the civilian labor force in ROI in 2019 was 45,363. The industry employing the highest percentage (26.6%) of the civilian labor force in the ROI is the educational services and health care and social assistance industry (Census 2021c). This is consistent with Alaska, which has 24.5% employed in this industry, which represents the greatest proportion of the state's labor force (Census 2021d). The top private employers in the ROI are Banner Health System (no longer in Alaska), Alyeska Pipeline Services, and Tanana Chiefs Conference. The top public employers are the University of Alaska Fairbanks, FNSB School District, Eielson AFB, and FWA (www.citytowninfo.com 2020).

Per capita income in the ROI is $39,252. This is relatively higher than Alaska, which has a per capita income of $36,978 (Census 2021c, 2021d). The (not seasonally adjusted) unemployment rate in the ROI is 5.1% which was slightly lower than Alaska's 6.6% (ADOLWD 2021b). The unemployment rate in Alaska generally matches the national rate of 6.7% (Bureau of Labor Statistics 2021).

Table 3.10-2 Employment by Industry in ROI and State of Alaska

CATEGORY	ROI	ALASKA
Population 16 years and over in the labor force	52,480	377,728
Percent of labor force in the Armed Forces	9.3%	3.3%
Population of employed persons in the civilian labor force	45,363	338,011
Percent Employed Persons in Civilian Labor Force (by Industry)		
Agriculture, forestry, fishing, hunting, and mining	3.7%	4.8%
Construction	8.2%	6.6%
Manufacturing	1.6%	4.2%
Wholesale trade	1.4%	1.9%
Retail trade	11.9%	10.4%
Transportation and warehouse, and utilities	7.7%	9.5%
Information	2.2%	1.9%
Finance and insurance and real estate and rental and leasing	3.6%	4.3%
Professional, scientific, and management, and administrative and waste management services	6.8%	8.9%
Educational services, and health care and social assistance	26.6%	24.5%
Arts, entertainment, and recreation, and accommodation and food services	7.7%	8.1%
Other services, except public administration	4.9%	5.1%
Public administration	13.6%	9.7%

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
The data presented here are estimates from the 2015-2019 American Community Survey.
Sources: Census 2021c, 2021d

3.10.2.3 Housing

Three housing options are available for Eielson AFB personnel: (1) on-installation privatized military family housing; (2) on-installation unaccompanied housing (dorms); and (3) off-installation housing.

Eielson AFB's military family housing is privatized and owned by Mayroad, who is responsible for maintaining, repairing, constructing, and managing the homes. As of September 2021, 94% of on-base housing was occupied, and 99% had been assigned. At that time, Eielson had 910 on-base family homes. Five of these were offline due to fire damage, leaving 905 available homes. Of these, 851 homes were occupied. The only vacant homes (n=54) were those undergoing change-of-occupancy maintenance caused by seasonally heavy turnover. As of August 2021, there were 119 families on the waiting list for on-base family housing. The wait time can exceed 16 weeks (Eielson AFB 2021b).

As of September 2021, Eielson's on-base dorm capacity was 94% full and rising. For unaccompanied personnel, Eielson's permanent party dorm capacity is 615 rooms. As of July 2021, 892 actual airmen were assigned. To alleviate the shortfall, in January-June 2021, 300 dorm-eligible airmen were authorized for release to off-base housing. While this helped the on-base housing situation, it contributed to the shortage in off-base rentals described below (Eielson AFB 2021b).

The Census estimates that as of 2019, the FNSB had 44,189 total housing units, with a low homeowner vacancy rate of 2.2% and a low rental vacancy rate of 7.9% (Census 2021g). FNSB housing statistics show a steady decline in available rentals since 2017. As of March 2021, there were 243 total rental housing units available in the FNSB, a 58% decrease since March 2017 when 443 units were available. By June 2021, the number of available rental units had fallen below 200 to 171 (FNSB 2021). Eielson AFB determined that in the period between June to August 2021, there were between 6 to 62 rental units available per week that were acceptable to USAF standards (Eielson AFB 2021b). Increasing rental rates reflect this decreased supply. Between March 2017 and March 2021, average monthly apartment rental rates increased 6% from $1,069 to $1,134. During the same period average house rental rates increased 9% from $1,769 to $1,933 (FNSB 2021).

Meanwhile, the number of new houses built each year has declined. From 2003-2011, the total annual construction in the FNSB ranged from 535-984 new structures per year. From 2012-2017, the annual total declined, ranging from 177-388 per year. From 2017-2020, between 278-319 new structures were built each year. Draft data indicates that construction of new homes has stalled in 2021 due to COVID shutdowns and supply chain interruptions, with only five new homes constructed by the second quarter of 2021. Home prices reflect this decreasing availability. In the 2-year period from the 2nd quarter 2019 to the 2nd quarter of 2021, average price of a 3-bedroom home increased 18% from to $250,106 to $295,143. In the 1-year period from the 2nd quarter 2020 to 2021, average price of a 3-bedroom home increased 12% from $277,962 to $295,143 (FNSB 2021).

In summary, both Eielson AFB and the FNSB are experiencing housing shortages. Both family and unaccompanied housing at Eielson AFB are at maximum capacity. Available rental units in FNSB are becoming increasingly scarce and increasing in price. Likewise, home prices are increasing as available houses for sale decrease dramatically. Meanwhile, construction of new homes and rental units has steadily decreased over the past decade, and seemingly stalled in 2021. The population of Eielson will increase as the F-35A beddown continues to full strength, further exacerbating the deteriorating baseline housing situation in the ROI.

3.10.2.4 Education

There are 36 schools in the FNSB School District, with total enrollment during the 2020-2021 schoolyear of 11,260 students. This includes 21 public elementary schools (5,677 students), 7 middle schools (1,355 students), and 8 high schools (4,228 students) (FNSB School District 2021).

Students living on Eielson attend on-base schools, which are run by the FNSB School District, and are the only schools within 5 miles of the installation. Kindergarten through 2nd grade students attend Anderson Elementary School, and 3rd through 5th grade students attend Anderson-Crawford Elementary School. Junior and senior high students attend Ben Eielson Junior/Senior High School. Approximately 1,015 elementary and 633 secondary students attend these on-base schools. Students living off-base attend the public school in their attendance area. Bus transportation is provided for children within the attendance area who live at least 1 1/2 miles from school. If a military family decides to live off-base in North Pole or Fairbanks, parents may request their children attend an on-base school. Permission may be granted provided classroom space is available and parents provide transportation (Eielson AFB 2017).

3.10.2.5 Installation and Public Services

Fire response and law enforcement services are provided by various city governments in the FNSB. The Fairbanks Fire Department, North Pole Fire Department, Moose Creek Fire Department, and the Salcha Fire Department each provide fire response services in the FNSB. At Eielson AFB, the 354 Civil Engineer Squadron fire department provides fire response services. The Fairbanks Police Department, North Pole Fire Department, and the Division of Alaska State Troopers provide crime response services in the FNSB. At Eielson AFB, the 354 Security Forces Squadron provides on-base crime response services.

Major public health facilities in the ROI include Fairbanks Memorial Hospital, which has 152 beds, and the Denali Center, which has 90 beds. On-base, the 354 Medical Group provides an outpatient primary healthcare clinic under the TRICARE program for eligible active-duty, beneficiaries, and USAF retirees living in the area. Pharmacy, laboratory, X-ray, and immunizations services are located in the clinic. A collocated dental clinic provides general dental care for active-duty military members.

Bassett Army Community Hospital on FWA serves as Eielson AFB clinic's primary referral source for specialty and inpatient care. The 354th Medical Group clinic has currently reached a saturation point in terms of both manpower and facilities, with no extra capacity in either (PACAF 2021, 2022). Manpower growth will need to occur to meet increased operational needs, however due to current space saturation, an expansion of the medical campus needs to occur to make room for additional manpower growth (PACAF 2021: 44). In addition, the Managed Care Support Contractor that manages Eielson's TRICARE program has been rated as inadequate (PACAF 2021). Recently, health facilities in the ROI have experienced a critical shortage of resources including staffing, available beds, and transfer options to other facilities due to the Covid pandemic. As a result, for a time, Fairbanks Memorial Hospital shifted to "crisis standards," which gave providers a framework for making difficult decisions about patient care and prioritization when resources are strained and is set by providers as a worst-case scenario (Anchorage Daily News 2021).

3.10.2.6 Environmental Justice

Demographic information on minority and low-income populations in the ROI and Alaska and United States comparative regions is presented in Table 3.10-3. Minority population levels within the ROI are lower than both Alaska and the United States. Within the ROI, the population reporting to be a race other than white was 31.1% of the total, which is lower than the 40.6% for Alaska, and the 38.4% for the United States. The Black/African American population in both the ROI (4.2%) and Alaska (3%) is substantially lower than the United States population (12.4%). Alaska Native/Native American population in the ROI (7.9%) is greater than the country (1.1%) but less than the state overall (15.2%). The Asian population in the ROI (3.2%) is significantly lower than both Alaska (6%) and the country (5.9%), both of which are statistically identical. The proportion of Pacific Islanders in the ROI (0.6%) and Alaska (2.5%) is greater than the US (.2%), but still relatively small. The population reporting as "other race" is identical in the ROI (2.3%) and Alaska (2.5%) but smaller than the nation (8.4%). The proportion of the population reporting "two or more races" is similar in the ROI (12.7%), Alaska (12.2%) and the county (10.2%). The percentage of individuals below the poverty level in the ROI (5.9%) is significantly lower than that of Alaska (10.1%), and the United States (12.3%) (Census 2021f, 2021e). The percentage of the population that is elderly in the ROI (11.3%) and Alaska (12.4%) is lower than the United States (16.5%), while the child-age population in the ROI (23.8%) and Alaska (24.6%) is slightly higher than the nation as a whole (22.2%).

Table 3.10-3 Minority, Low-Income, and Poverty Status

CATEGORY	FNSB	ALASKA	UNITED STATES
Population	95,655	733,391	331,449,281
Percent Population Below Poverty Level	5.9%	10.1%	12.3%
Percent Elderly	11.3%	12.4%	16.5%
Percent Children	23.8%	24.6%	22.2%
Race			
White	68.9%	59.4%	61.6%
Black	4.2%	3%	12.4%
Alaska Native or Native American	7.9%	15.2%	1.1%
Asian	3.2%	6%	5.9%
Pacific Islander	0.6%	1.7%	0.2%
Other Races	2.3%	2.5%	8.4%
Two or More Races	12.7%	12.2%	10.2%

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: Census 2021e, 2021f

Under baseline conditions, no off-base minority or low-income populations and no concentrations of children or the elderly experience noise levels exceeding 45 dB DNL, a level that is considered consistent with ambient noise conditions (Section 3.2.2). On-base, two schools (Ben Eielson Junior/Senior High School and Anderson-Crawford Elementary School) and a day care center (Eielson Child Development Center) are exposed to noise levels less than 65 dB DNL. These schools currently experience one to three indoor speech interference events per hour with either the windows closed or open. Classroom learning interference events are also one to three events per hour with windows closed or open (Section 3.2.2).

In terms of air quality, Eielson AFB is in an attainment area for criteria pollutants with no existing health issues associated with their emissions to affect environmental justice communities, children, and the elderly. However, in the adjacent FNSB region, $PM_{2.5}$ is in non-attainment and CO is in maintenance (Section 3.3.2). There are no existing health or other safety issues from Eielson AFB related to fire risk and management, APZs, aircraft mishaps, and BASH to affect environmental justice communities, children, and the elderly (Section 3.5.2). There are no existing health or other issues related to hazardous/toxic materials and wastes, contaminated sites, or water quality from Eielson AFB that affect environmental justice communities, children, and the elderly.

3.10.3 Environmental Consequences

Socioeconomic impacts are assessed in terms of direct impacts on the local economy and related impacts on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a proposed project. The USAF has defined the following significance indicators with respect to socioeconomic impacts: (1) substantial change in the local or regional economy, employment, or business volume; (2) substantial change in the local or regional population and in housing, education, installation services, or public services from the increased or decreased demands of the population change.

The potential for disproportionate impacts on minority and low-income populations is determined by comparing the percentage of each population in the ROI with the percentage of each population in the community of comparison. If the percentage of minority or low-income population within the ROI is greater than or equal to the percentages within the community of comparison, then disproportionate impacts on that population could be present if the addition of four KC-135 to Eielson AFB has a potential to impact that population. However, if the percentage of minority or low-income population within the ROI is less than the percentages within the community of comparison, there would be no disproportionate impacts (USAF 2014).

For child and elderly populations, disproportionate impacts are inherent. The extent to which child and elderly populations would be impacted is disproportionate due to their vulnerabilities from age-related physiological differences in types and levels of exposure, and therefore, the evaluation of environmental impacts on these populations differs from the evaluation of impacts on adults and other populations.

3.10.3.1 Proposed Action

Socioeconomic Impacts

The population increase at Eielson AFB from the addition of four KC-135's has the potential to cause adverse impacts to housing and health care. Eielson AFB is already under-capacity for on-base housing and at saturation point for health care. The ROI currently has a shortage of available rental units, homes for sale, and new home construction. The additional 254 personnel, and as-of-yet unknown number of dependents, required to support the additional KC-135 would cause an increase in housing and medical demand.

Unaccompanied housing—As of July 2021, Eielson has 892 airmen assigned to 615 dorm rooms, which represents 94% capacity of the base's available 950 beds, and 300 unaccompanied airmen have been released to off-base housing. The construction of the new 96-person dorm, anticipated for FY2027/28, would alleviate some of the need for unaccompanied housing. While the construction of the new 96-person dorm would help to mitigate the impact, it would be devoted to absorbing the current shortfall in unaccompanied housing and would be insufficient to house the expected number of unaccompanied personnel associated with the Proposed Action. Further, the dorm would not be completed and available until 2026/2027, leaving a potential 2- to 3-year gap in dorm capability to support the KC-135 mission. The Proposed Action would result in a substantial increase in demand for unaccompanied personnel housing, for an unknown duration. The base would be unable to provide housing for personnel necessary, driving unaccompanied airmen to seek housing in the local economy, thereby causing a correlated substantial increase in rental demand, availability, and pricing in the ROI. However, the USAF has determined that this does not constitute a significant impact.

Family housing—Eielson AFB military family housing is currently insufficient to meet the requirements of the Proposed Action. Military family housing is at capacity, at times with more than 100 families on the waiting list and wait times of up to 4 months. Military families would be forced to seek housing in communities throughout the FNSB, which is also experiencing a housing shortfall. This would cause a substantial increase in demand and pricing for suitable homes in the ROI, which could constitute a substantial adverse socioeconomic impact. It seems likely that new home construction and the local housing market would increase to meet this demand, despite the lack of supporting economic indicators to suggest increased home construction in the ROI. Eielson AFB is coordinating with the FNSB mayor and assembly regarding the housing shortage. The FNSB recently approved a housing incentive for new construction of multi-family units within the city limits of Fairbanks and North Pole: 1-4 unit developments can receive a tax exemption of up to 2 years, while 5+ unit developments can receive up to a 10-year exemption. Eielson AFB is also currently delaying dependent stationing for personnel, postponing travel for military dependents until housing is secured. The Proposed Action could pose a substantial adverse socioeconomic impact for a period of several years. However, the USAF has determined that this does not represent a significant adverse socioeconomic impact.

Medical facilities—Eielson AFB's clinic operated by the 354th Medical Group clinic has currently reached a saturation point in terms of manpower and facilities, with no extra capacity. Recently, health care facilities in the ROI have been overwhelmed with the Covid pandemic, instituting crisis standards of care, limiting those that they will treat. There is little surplus medical capacity in the ROI to meet the care required by the personnel associated with the Proposed Action. The addition of KC-135 assets is a potential tipping point for contingency medical operations and the current facility is not adequate to support medical mission growth, which is a result of the Eielson AFB's evolving mission as a combat generation base in an evolving competitive region (PACAF 2021). Eielson AFB has proposed construction of an additional 10,000 SF of medical facilities, and stationing of additional medical personnel. If funded, groundbreaking would begin in FY2025. A dedicated area for Tele-Medicine to occur is also anticipated (PACAF 2022). The increased demand on medical care associated with the Proposed Action could constitute a substantial socioeconomic impact in the ROI. The proposed new 10,000-SF medical facility and additional medical personnel would eventually alleviate the impact. In the interim, Eielson AFB has also proposed installing trailers to house additional medical facilities. Thus, the impact's duration would be temporary to medium-term, until the completion and operation of the new facilities and/or installation of medical trailers. The USAF does not consider the impact to medical from the Proposed Action a significant socioeconomic impact.

Short-term, minor, beneficial impacts on the local economy would occur from the proposed construction, demolition, and renovation projects associated with the Proposed Action. These activities would stimulate the local economy through the employment of construction workers and the purchase of construction-related materials and other goods and services, as well as secondary purchases of goods and services. Due to the short-term nature of construction, the economic benefits would be temporary.

The proposed construction and associated expenditures could generate additional jobs, most likely in the construction industry, but also in other industries, such as retail, that would generate additional indirect and induced income in the FNSB.

In 2020, The FNSB had a civilian labor force of 45,363 people of which 3,486 (8.2%) were employed in the construction industry (Census 2021c). It is expected that the local labor force would be sufficient to meet the demand for new jobs in the construction and other industries without a migration of workers into the area. Therefore, no impacts on population would occur because it is expected that construction workers would be from the local or regional area.

In summary, the Proposed Action could result in substantial adverse socioeconomic impacts to housing and medical care in the ROI for a medium-term duration of several years. There are indicators of significance based on a potential lack of funding for housing and medical care; therefore, the USAF has determined that the impacts are substantially adverse but continues to evaluate solutions to mitigate the issues. Per NEPA's implementing guidelines set forth at 40 CFR 1502.16(b), economic or social effects by themselves do not require preparation of an EIS.

Environmental Justice Impacts

Possible adverse effects from the Proposed Action could include increased traffic and noise levels and decreased air quality and infrastructure capacity, but these effects would be short-term, intermittent, and minor, and would likely impact installation residents more than off-installation populations. The ROI has a considerably lower percentage of residents of a racial minority and low-income residents than Alaska and the U.S. Within the ROI 31.1% population is minority, versus 40.6% of Alaska's population, and 38.4% for the U.S. The percentage of people living in poverty in the ROI (5.9%) is also lower than Alaska's (10.1%) and the country (12.3%). The ROI's population also has a lower percentage of elderly than the state or nation, and a statistically similar number of children. The Proposed Action might have short-term, negligible to minor, adverse effects on minority and low-income populations from construction noise and traffic, decreased air quality, and infrastructure capacity, however, as stated above these would occur primarily on the base and would also be experienced by the base's population. Therefore, disproportionate impacts on minority or low-income populations would not be expected. Significant adverse impacts to Environmental Justice populations are not anticipated from the Proposed Action.

3.10.3.2 No Action Alternative

The No Action Alternative would not result in additional socioeconomic or environmental justice impacts. The population in the ROI would most likely continue to increase, following the trend observed from 2000 through 2020. The proposed construction, demolition, and renovation projects would not occur, and there would be no associated expenditures that would provide short-term construction employment or generate additional indirect and induced income beyond the scope of normal conditions and influences within the ROI. The 254 additional personnel would not be stationed at Eielson AFB, and there would be no associated socioeconomic impacts beyond those already occurring within the ROI.

3.10.4 Cumulative Impacts

Cumulatively, the Proposed Action and other reasonably foreseeable actions would have substantial adverse socioeconomic impact. The Proposed Action would have a substantial adverse impact on housing availability and the health care in the ROI. The current F-35A beddown is causing a substantial increase in Eielson AFB's population and is one of the primary causes of the baseline decrease in housing availability and Eielson's health care capacity. As of September 2021, Eielson AFB and the ROI are experiencing a shortage in available housing, due to significant increase in demand resulting from the current F-35A beddown, exacerbated by other impacts (Eielson AFB 2021h, 2021h; Eielson AFB, FWA, AK and FNSB 2021; PACAF 2021). Any further actions that cause a considerable increase in population at Eielson AFB, nearby FWA, or anywhere else in the ROI would cumulatively add to the FNSB's housing shortage and medical care crisis. These would constitute substantial adverse cumulative impacts, the duration of which remains unknown. Per NEPA's implementing guidelines set forth at 40 CFR 1502.16(b), economic or social effects by themselves do not require preparation of an EIS.

There would also be short-term, minor to moderate, beneficial socioeconomic impacts in the ROI and state through the increased demand for construction workers and the procurement of goods and services. Construction-related expenditures would not be expected to generate long-term cumulative socioeconomic benefits.

Because the proposed projects would not result in disproportionately high and adverse impacts on environmental justice populations, they would not contribute to cumulative environmental justice impacts in the region.

3.11 Infrastructure and Utilities

3.11.1 Definition of Resource

Infrastructure refers to a man-made array of systems and physical structures that enable a population in a specified area to function. There is a direct correlation between the type and extent of infrastructure available to an area and its characterization as urban or developed. Infrastructure provides the ability and capacity for the economic growth of an area. Components of infrastructure include utilities, solid waste management, and the transportation system. Utilities include electrical supply, water supply, sanitary sewer system, fuel supply, and stormwater drainage system.

3.11.2 Affected Environment

3.11.2.1 Road Network

The road network at Eielson AFB consists of 58,666 square yards of pavement. The roads are considered to be in fair to good condition, with sustainment, restoration, and modernizations efforts having restored a number of roads previously in poor condition. The 10-year pavements plan was updated in 2012 to contain 40 development projects. The general flat and low-lying nature of the base results in poor drainage for pavements and increases cost of associated maintenance and upkeep (Eielson AFB 2016b).

3.11.2.2 Electrical Supply

Electricity at Eielson AFB is supplied by the CH&PP. The CH&PP has an electrical generation capacity of 23 kilovolt-amperes (kVA), with peak demand coming at 16 kVA. Eielson AFB also has a tie-in with the local utility company Golden Valley Electric Association to purchase an additional 10 kVA if needed. Currently, the CH&PP has high reliability in supplying electricity to Eielson AFB and the training ranges with over 50 miles of cable, sufficient backups, and redundancy in place (Eielson AFB 2016b).

3.11.2.3 Water Supply

Six on-base wells supply Eielson AFB with water. These wells are connected to a 3.2 million GPD filtration plant. Water treatment, storage, and increased production capacity were added through an upgrade to the plant in 1999. The plant also has bypass system to route chlorinated water directly to the distribution system, if needed. Small self-contained systems are installed for base facilities outside of the central system. The plant has a peak capacity of 7.2 million GPD, with average demand of 0.3 million GPD during normal conditions and 1 million GPD during fire season. Currently, the plant is being upgraded to comply with SDWA regulations. Upgrades include installing monitors for turbidity levels, replacing plant service lines, installing power meters on well houses and the main plant, and transitioning to a Supervisory Control and Data Acquisition system (Eielson AFB 2016b).

3.11.2.4 Wastewater System

Eielson AFB is serviced by a wastewater system with a capacity of 2 million GPD. The average wastewater discharge flows are significantly below the capacity of treatment systems, with current average demand of 0.4 million GPD and a peak demand of 0.7 million GPD. A natural infrastructure assessment conducted in 2012 gave the wastewater system an overall rating of N-0, designating the resource as capable of fully supporting current and future mission requirements with no workarounds. The WWTP is used to treat wastewater collected on-base and from individual septic systems in outlying areas that cannot be connected to the central system in an economical way. The sewer lines connecting the base to the WWTP are located inside a utilidor system, with lift stations located across the base to connect with the gravity-fed portion. Wastewater is discharged into the on-base lagoon, which is not degraded, and the water treatment plant filter backwash water is discharged into a designated water body. The WWTP was built in 1953 with upgrades in mid-1990s and retrofits from 2004 through 2013 (Eielson AFB 2016b).

3.11.2.5 Stormwater System

The Eielson AFB stormwater system was rated as N-1 by the 2012 natural infrastructure assessment. Due to the base's relatively flat terrain, porous soils, and location in sub-arctic desert, the stormwater collection systems are minimal with relatively few catch basin-pipe systems on-base. Currently, stormwater runoff is directed toward grassy fields and retention ponds, where it readily percolates into the ground. Surface drainage is from north-northwest parallel to the Tanana River. Stormwater is discharged into a receiving body that is degraded, but the degradation does not limit the installation's capacity to discharge under the permit limits (Eielson AFB 2016b).

3.11.2.6 Heating and Cooling System

Eielson AFB is supplied with steam heat by the CH&PP. The CH&PP originally had six 120,000 pounds per hour (lb/hr) coal-fired boilers (four installed in 1951 and two in 1954). One boiler has been brought offline due to building improvements and increased energy efficiency. The boilers at the CH&PP burn sub-bituminous coal, with a current average use of 195,843 tons per year. The coal is supplied to the CH&PP via rail from nearby coal mines. A 90-day supply stockpile is maintained at the CH&PP to meet additional requirements of surge trainings and mission activities. The steam produced by the boilers is also used by five steam turbines to generate electricity, and the extracted steam is supplied to the base for heating through the utilidor system. The boilers are run at reduced capacity due to their age and new

State emission standards. Currently, the operation range of the boilers is at 60,000 to 85,000 lb/hr of steam with peak installation demand of 270,000 lb/hr (Eielson AFB 2016b).

3.11.3 Environmental Consequences

The environmental consequences of the Proposed Action or the No Action Alternative are evaluated based on their potential for disruption or improvement of existing levels of service and additional needs for energy and water consumption, sanitary sewer and wastewater systems, and transportation. These impacts would be due to physical changes to traffic, construction, energy needs created during construction and increase in population of the installation.

3.11.3.1 Proposed Action

Road Network

Short-term, negligible, adverse impacts would be expected on the installation's road network. Construction-related impacts would include rerouting of certain roads and lane closures. Construction would temporarily increase usage of the installation's access gates, roadways, and parking areas due to increased traffic, which would include construction workers, construction vehicles, and equipment accessing the site. Staging heavy equipment on-site overnight for the duration of projects could reduce some traffic.

Long-term, minor, adverse impacts on the road network would be expected from the increased number of personnel associated with the Proposed Action. The additional 254 personnel would result in a minor increase in the number of vehicles on the road. The long-term strategic vision plan in the IDP includes a fully operational second gate, which would alleviate this impact. While the increased traffic will contribute to existing congestion at access gates during peak hours, the access gates and road network would be able to accommodate the increase in POVs.

Electrical Supply

Short-term, negligible, adverse impacts on the electrical system would be expected during the construction, demolition, and renovation phases of the Proposed Action. Temporary electrical supply interruptions would occur as facilities are disconnected and reconnected. Disruption to electrical systems would be temporary, and advanced planning and notification of outages would ensure continuity of operations.

Long-term, minor, adverse impacts on the electrical system would be expected during the operations phase of the Proposed Action. There would be a slight increase in electrical power usage due to the increase in personnel, new and expanded facilities, and additional infrastructure. The increase would be negligible compared to total power usage and demand at the installation.

Water Supply

Short-term, negligible, adverse impacts would be expected on the water system during the construction phase of the Proposed Action. The installation water supply system would supply the minimal amount of water necessary for construction and demolition and would have minimal impact on the water supply system.

Long-term, minor, adverse impacts on the water supply system would be expected as a direct result of the increase in personnel. For additional details on estimated increases to water demand, refer to Section 3.4.3.1.

Wastewater System

No impacts on the wastewater system would be expected during the construction phase of the Proposed Action. Temporary portable wastewater facilities would be provided during construction, and wastewater would be disposed of off-installation.

Long-term, negligible, adverse impacts would be expected on the wastewater system from the increase in personnel. DoD assumes typical wastewater generation per person to be 80 GPD. The 254 additional personnel would result in an increase of 20,320 GPD of wastewater. The WWTP is capable of handling the increased demand.

Stormwater System

Short-term, negligible, adverse impacts would be expected on the stormwater system. The Proposed Action construction would result in approximately 378,236 SF of disturbance. Soil disturbance from demolition and construction could temporarily disrupt existing man-made stormwater drainage systems and natural drainage patterns through soil erosion and sediment production. A site-specific SWPPP that includes soil erosion and sediments controls, and construction site waste controls would be required, as discussed in Section 3.4.3.1.

Long-term, negligible, adverse impacts on the stormwater system would be expected from the Proposed Action as it would add an estimated 361,786 SF of impervious surface. Stormwater control infrastructure, such as culverts, ditches, drains, and piping, would be installed as necessary to mitigate additional stormwater runoff and minimize adverse impacts on the stormwater system, as discussed in Section 3.4.3.1.

Heating and Cooling System

No impacts to the heating and cooling system would be expected during the construction phase of the Proposed Action. Construction would occur from May to September, and temporary heating sources would be used as necessary.

Long-term, negligible, adverse impacts on the heating and cooling system would be expected due to increase in heat demand for the additional personnel and facilities associated with the Proposed Action. Coal demand for the CH&PP would be expected to increase by 6%. This corresponds to a demand of 207,594 tons per year, which is below the CH&PP's permitted limit of 220,000 tons of coal per year (Eielson AFB 2022c). The existing utilidor network would supply steam heat to new facilities.

3.11.3.2 No Action Alternative

There would be minor, negligible, beneficial impacts on infrastructure and utilities associated with the No Action Alternative. There would be no increase in demand from existing infrastructure and utilities. Base development would continue, guided by the IDP. Utility upgrades over time would result in beneficial, long-term effects, mitigating any adverse impacts caused by current ongoing or future projects.

3.11.4 Cumulative Impacts

The Proposed Action and potentially foreseeable actions, such as the micro-reactor pilot project, would result in minor, long-term, adverse, and beneficial cumulative impacts on Eielson AFB's infrastructure and utilities. The CH&PP is considered mission critical facility as significant damage to facilities and infrastructure may occur with a prolonged shut-down. Regular boiler upgrades are required due the high importance of the CH&PP. The addition of the micro-reactor to Eielson AFB as an alternative source of heat and power would alleviate demand on the aging CH&PP. Potential future base expansion and development would also result in an increased demand on the existing infrastructure, resulting in adverse impacts. However, most of the infrastructure at Eielson AFB has peak capacity capable of supplying any increased demand for future projects.

3.12 Other NEPA Considerations

3.12.1 Unavoidable Adverse Effects

In accordance with 40 CFR 1508.27, this EA identifies any unavoidable adverse impacts from the Proposed Action. Energy supplies would be committed to the Proposed Action, which would require the continued use of non-renewable fossil fuels, during construction and aircraft O&M. Non-renewable resource use under the Proposed Action is an unavoidable occurrence, although not considered significant.

Unavoidable short-term adverse impacts associated with the Proposed Action would include: temporary erosion and sedimentation from soils disturbance, a temporary increase in fugitive dust and air emissions during construction, intermittent noise, and minor alterations to local traffic and airfield operations. However, these effects are considered minor and would be confined to the immediate area. Implementing environmental controls required by permits and approvals would minimize potential impacts. Unavoidable, long-term, adverse impacts would occur to up to 0.6 acres of floodplains from the fuel storage tank construction project. While the adverse impact to the floodplain would be long-term, it would not be expected to have a significant adverse impact on the floodplain's ability to moderate floodwater impacts (Section 3.4.3.1).

3.12.2 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between short-term uses and enhancement of long-term productivity from the Proposed Action is evaluated from the standpoint of short-term and long-term effects. Under the Proposed Action, short-term uses of the environment would result in noise and air emissions from construction equipment and aircraft operations. Noise and air emissions would not be expected to result in long-term, adverse impacts on noise-sensitive receptors or wildlife. Long-term impacts are not expected due to the interim nature of proposed construction and because local wildlife are likely habituated to aircraft noise. The nature of activities for the Proposed Action would not differ from current uses of these areas.

The Proposed Action represents an enhancement of long-term productivity for aircraft operations at Eielson AFB. The negative effects of short-term operational changes during construction would be minor compared to the positive benefits from the additional aircraft, personnel, and infrastructure. Immediate and long-term benefits would be realized for O&M.

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4.0 LIST OF PREPARERS

This EA has been prepared by Brice Environmental Services Corporation (Brice) under the direction of the Air Force Civil Engineer Center (AFCEC), USAF, and Eielson AFB.

The individuals that contributed to the preparation of this EA are listed below.

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Notes:
For definitions, refer to the Acronyms and Abbreviations section.

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Notes:
For definitions, refer to the Acronyms and Abbreviations section.

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APPENDIX A
INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND PUBLIC PARTICIPATION

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GENERAL SCOPING LETTER

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The following general scoping letter was sent to the stakeholders identified in Table 5-1 Persons and Agencies Consulted/Coordinated.

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

28 November 2022

Jamie Burke
NEPA Program Manager
354 CES/CEIE
2310 Central Avenue, Suite 100
Eielson AFB AK 99702

Agency Address Here

Dear Stakeholder Name

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per the National Environmental Policy Act (NEPA) of 1970, as amended, 40 CFR Part 1501.9, Scoping, the USAF is using an early and open process to determine the scope of issues for analysis and engaging early with likely affected Federal, State, Tribal, local agencies and governments, and other likely affected or interested persons as it develops this undertaking.

The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. A change in airspace is not included in the undertaking. The undertaking would have 18 associated construction, demolition, and renovation projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. The Area of Potential Effect (APE) for this undertaking is therefore defined as the as specific areas of disturbance associated with proposed facility construction, demolition and renovation as shown in Attachment 2. For architectural resources, the APE includes a buffer to account for auditory or visual impacts. The APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active Air Force base, this buffer should capture all locations from which individual project construction or demolition activity may be visible or audible. As there would be no geographic expansion of flight patterns, airspace use, or air operations, the APE for this analysis does not include airspace.

I invite you to participate in the scoping process by responding to this letter with any information, concerns, potential impacts, relevant effects of past actions and possible alternative actions regarding this undertaking. Any information you provide will be taken into consideration by USAF as it develops its Environmental Assessment for the undertaking. The Draft Environmental Assessment is anticipated to be available for public review and comment in December 2022.

If you have any questions, please contact David Martin, Air Force NEPA Division (AFCEC/CZN), at david.martin.127@us.af.mil or Eielson Public Affairs Office at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116. Thank you in advance for your assistance in this effort.

Sincerely

BURKE.JAMIE.LYN.1604772067 Digitally signed by BURKE.JAMIE.LYN.1604772067 Date: 2022.11.28 14:10:29 -09'00'

JAMIE BURKE, GS-11, DAF

2 Attachments:
1. Project Location
2. Area of Potential Effect

STATE HISTORIC PRESERVATION OFFICE CONSULTATION

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

August 31, 2022

Jamie Burke
NEPA Program Manager
354 CES/CEIE
2310 Central Avenue, Suite 100
Eielson AFB AK 99702

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage AK 99501-3565

Dear Ms. Bittner:

The United States Air Force (Air Force) is proposing to station four additional KC-135 Stratotanker aircraft at Eielson Air Force Base (AFB), Alaska. Attachment 1 shows the project location. To take into account various environmental concerns, the Air Force is engaging early with the appropriate resource and regulatory agencies as it formulates the undertaking. The Air Force is also preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the KC-135 basing action.

In accordance with Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, the Air Force, Eielson AFB, is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking would require aircraft, personnel, and infrastructure/facilities to support the Eielson AFB mission. The undertaking would consist of the addition of four KC-135 aircraft and 254 supporting active-duty personnel to form an "Active Associate Squadron," which would result in the following changes:

- An increase in the number of KC-135s stationed at Eielson AFB
- An increase in KC-135 support personnel
- An increase in KC-135 operations and maintenance activities
- Construction, demolition, and facility renovation to support increased personnel and operations

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. They would be stationed at the installation in phases, with the first aircraft arriving in FY23.

A total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; FNSB 2021). The undertaking would represent a 4.7% increase in the installation population.

The undertaking is estimated to increase the installation's KC-135 annual operations by 200%. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. A change in airspace is not included in the undertaking.

The undertaking would have associated construction and demolition projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. Attachment 2 shows facilities development associated with the undertaking.

New facilities to be constructed include:

- Aerospace Ground Equipment (AGE) Warm Storage (7,500 SF)
- 9-Bay Vehicle Warm Storage (9,000 SF)
- CTK/Maintenance Storage (4,500 SF)
- Maintenance Admin (4,000 SF)
- OG Parking (16,100 SF)
- Fuel Receipt Tank (26,000 SF)
- 96-Man Dormitory (18,500 SF)
- 96-Man Dormitory Parking (38,000 SF)
- 96-Man Dormitory Fire Lane (10,000 SF)
- Maintenance Hangar (188,000 SF)

Facilities to be demolished are:

- Bldg 1173 Tug & De-icer Warm Storage (7,500 SF)
- Bldg 1174 Refueling Pump Station (7,500 SF)

Facilities to be renovated include:

- Bldg 1168 Maintenance (8,500 SF)
- Bldg 1171 Fuel Cell Hangar (5,000 SF)
- Bldg 1172 AGE Warm Storage (4,686 SF)
- Bldg 3129 Squad Ops (15,200 SF)
- Bldg 3229 Fuel/Fire Vehicle Maintenance (6,800 SF)
- De-icer tank (Bldg 6260) (0 SF)

Area of Potential Effect

The Area of Potential Effect (APE) for this undertaking is the specific area of disturbance associated with proposed facility construction, demolition and renovation as shown in Attachment 2. For architectural resources, the APE includes a buffer to account for auditory or visual impacts. This APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active Air Force base, this buffer should capture all locations from which individual project construction or demolition activity may be visible or audible. As there would be no change to airspace use, or flight patterns from the undertaking, the APE for this analysis does not include airspace. The APE is found on U.S. Geological Survey (USGS) topographic map FAI C-1 (Fairbanks Meridian), Township 3S, Range 3E, Sections 11 and 13.

Identification of Historic Properties

Eielson AFB has conducted both archaeological and architectural surveys within the APE (Eielson AFB 2019) and determined that no archaeological sites are present. Adjacent to the undertaking's APE is the Eielson AFB Flightline Historic District, which consists of 19 contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

The undertaking would result in no direct impacts to architectural resources that qualify as historic properties. Table 1 lists the NRHP status of facilities that would experience additions, alterations, or demolition as part of the undertaking. Except for one (the de-icer tank), all were built in the past 35 years. None of these are associated with the Cold War or rise to the level of exceptional significance required for NRHP eligibility for properties less than 50 years old. None is a contributing element to the Flightline Historic District. Modifications to, or demolitions of, these buildings would not constitute direct effects to historic properties. While the de-icer tank (FAI-02494) was built in 1954, it was surveyed and evaluated in 2018. The de-icer tank, and other nearby associated facilities at the Eielson POL facility, were determined not eligible for the NRHP either individually or as a district, with SHPO concurrence in 2019 (Bittner 2019; Maggioni and Bowman 2018).

Table 1 NRHP Status of Facilities Proposed for Additions/Alterations/Demolition

Building Number	AHRS Number	Year built	NRHP Eligibility	Action
1168	NA	1998	Not Eligible	Addition
1171	FAI-00671	1997	Not Eligible	Addition
1172	FAI-00672	1996	Not Eligible	Addition
1173	FAI-00673	1996	Not Eligible	Demolition
1174	FAI-00674	1990	Not Eligible	Demolition
3129	FAI-00780	1995	Not Eligible	Renovation
3229	FAI-00790	1987	Not Eligible	Renovation
De-icer tank (6260)	FAI-02494	1954	Not Eligible	Renovation

As shown in Table 2, for most development associated with the Proposed Action, which is primarily focused in the southern portion of the flightline, the nearest contributing element is Building 1183, the Squadron Operations Building listed with the AHRS as site FAI-00679. The closest project, the Building 1168 addition, is 120 feet away. Only three other projects are within 500 feet. Most are between 500 to 800 feet away. The furthest, the demolition of Building 1171, is 850 feet distant. Several projects are within 1000 feet of Building 3112, Amber Hall, which is listed with the AHRS as site FAI-00769. These projects – (1) the Building 1171 addition/renovation; (2) the Building 1172 addition/alteration; (3) construction of the AGE Warm Storage facility; (4) the Building 1173 demolition; and (5) the Hangar 3 construction – are 900 to 1000 feet away.

The Hangar 3 Option #1 (North of Building 1171) site is 170 feet from Amber Hall, and also 75 feet from Building 1146 (FAI-00663), which is a Cold War Maintenance Ops/Electrical Power Station. Other historic properties nearby the Hangar 3 Option #1 are Building 1141 (FAI-00659; Aircraft Maintenance Shop) and Building 1140 (FAI-00658; Strategic Air Command Hangar) which are 690 and 700 feet away, respectively.

Option #2 for Hangar 3 (North of Building 1120) is within 50 feet, nearly adjacent, to Building 1120 (FAI-00642), which is a Maintenance Dock historic property. Building 1121 (FAI-00642), also a Maintenance Dock historic property is 385 feet away. Three Butler Building Warehouses that are Flightline Historic District contributing elements – Building 1123 (FAI-00644), Building 1124 (FAI-00645), and Building 1125 (FAI-00646) – are between 750 and 800 feet away.

In terms of effects to historic properties within the indirect APE, while construction and demolition associated with the undertaking could be seen and heard from these nearby historic properties, noise and visual impacts would be minor, and temporary. They would not permanently affect integrity or characteristics that make the individual property or the Flightline District eligible for inclusion on the NRHP. Setting and feeling would remain consistent with that of an active military base and would not be adversely impacted. Land use and setting would remain consistent with intended use on a military facility.

Table 2 Historic Properties within 1000’ of Proposed Undertaking Projects

Project	Nearest Historic Property/Historic District Contributing Element	Distance (feet)
Building 1168 addition (Maintenance)	Building 1183 (FAI-00679)	120
Building 1171 addition/renovation (Fuel Cell Hangar)	Building 1183 (FAI-00679) Building 3112 (FAI-00769)	850 950
Building 1172 addition/alteration (AGE Warm Storage)	Building 3112 (FAI-00769)	975
Building 1173 demolition (Tug & De-icer Warm Storage)	Building 1183 (FAI-00679)	850
Building 1174 demolition (Refueling Pump Station)	Building 1183 (FAI-00679)	715
Building 3129 addition/renovation (Squad Ops)	Building 1183 (FAI-00679)	810

Table 2 Historic Properties within 1000' of Proposed Undertaking Projects

Project	Nearest Historic Property/Historic District Contributing Element	Distance (feet)
Building 3229 addition (Fuel/Fire Vehicle Maintenance)	Building 1183 (FAI-00679)	690
Construct Aircraft Ground Equipment (AGE) Warm Storage	Building 3112 (FAI-00769)	900
Construct 9-Bay Vehicle Storage	Building 1183 (FAI-00679)	700
Construct Maintenance Administration Building	Building 1183 (FAI-00679)	350
Construct CTK Maintenance Facility	Building 1183 (FAI-00679)	350
Construct 96-man Dormitory*	None	NA
Construct 96-man Dormitory Parking*	None	NA
Construct 96-Man Dormitory Fire Lane*	None	NA
Construct 420k-gallon Fuel Receipt Tank*	None	NA
De-icer tank repair/replacement*	None	NA
Construct Maintenance Hangar (Option #1)	Building 1146 (FAI-00663) Building 3112 (FAI-00769) Building 1141 (FAI-00659) Building 1140 (FAI-00658)	75 170 690 700
Construct Maintenance Hangar (Option #2)	Building 1120 (FAI-00642) Building 1121 (FAI-00642) Building 1125 (FAI-00646) Building 1124 (FAI-00645) Building 1123 (FAI-00644)	50 385 780 785 790

Notes:
*No Historic Properties or Historic District contributing elements are within 1000 feet

No historic properties are within 1000 feet of the dormitory construction site or the new fuel receipt tank site. Both sites in the main base area have been surveyed and inventoried. No historic properties are nearby, and both sites are in areas of previous construction disturbance.

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

No Adverse Effect

Eielson AFB has reviewed the Criteria of Adverse Effect and have determined that none apply to the activities that would be carried out in this undertaking. Pursuant to 36 CFR § 800.5(b), the Air Force has determined that there would be no adverse effect to historic properties by the KC-135 basing action. Attached for your review are copies of relevant supporting documents supporting the Air Force's findings and determinations.

We request your comment and/or concurrence on the finding of *No Adverse Effect*. If we do not receive your comments and/or concurrence within the required 30 days, we will assume concurrence and proceed with the undertaking as described.

Please contact Ronald Gunderson, Natural/Cultural Resources Manager, 354 CES/CEIEA, at ronald.gunderson@us.af.mil or (907) 377-5182 if you have any questions.

Sincerely,

BURKE.JAMIE.LYN.1604772067 Digitally signed by BURKE.JAMIE.LYN.1604772067 Date: 2022.09.02 15:57:15 -08'00'

JAMIE L. BURKE, GS-11, DAF

3 Attachments:
1. Project Location
2. Area of Potential Effect and Historic Properties

cc:
PACAF/A4/A6/A7

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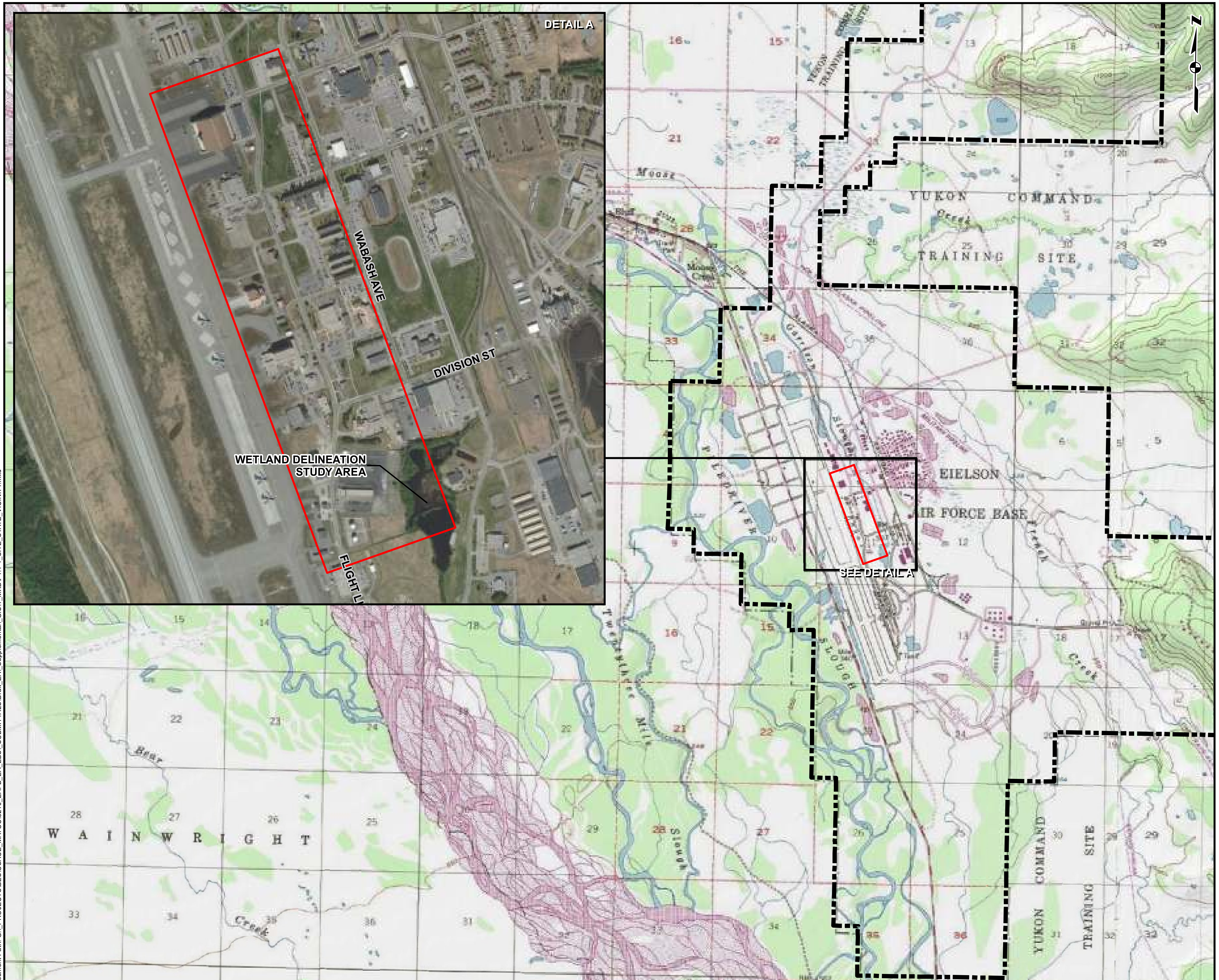
Attachment 1 Project Location

1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

SITE LOCATION AND VICINITY



Legend

- Approximate Region of Influence
- Installation Boundary

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

ALASKA STATE PLANE ZONE 3. U.S. SURVEY FEET
HORIZONAL DATUM: NAD83(2011) | VERTICAL DATUM: NAVD88

1 0.5 0 1 2
Miles

PROJECT No.: 321004	DATE: 4/18/2022	FIGURE: 1
P.M.: M.V.	DRAWN: J.C.	

Document Path: G:_PROJECTS\BES\USACE_MATOC\3210_EAFB_EA_EBS_SUBMITTALS\Draft_EA_Supplemental_GIS\1_MXD\F1.1-1_SITE_STATE_VICINITY.mxd

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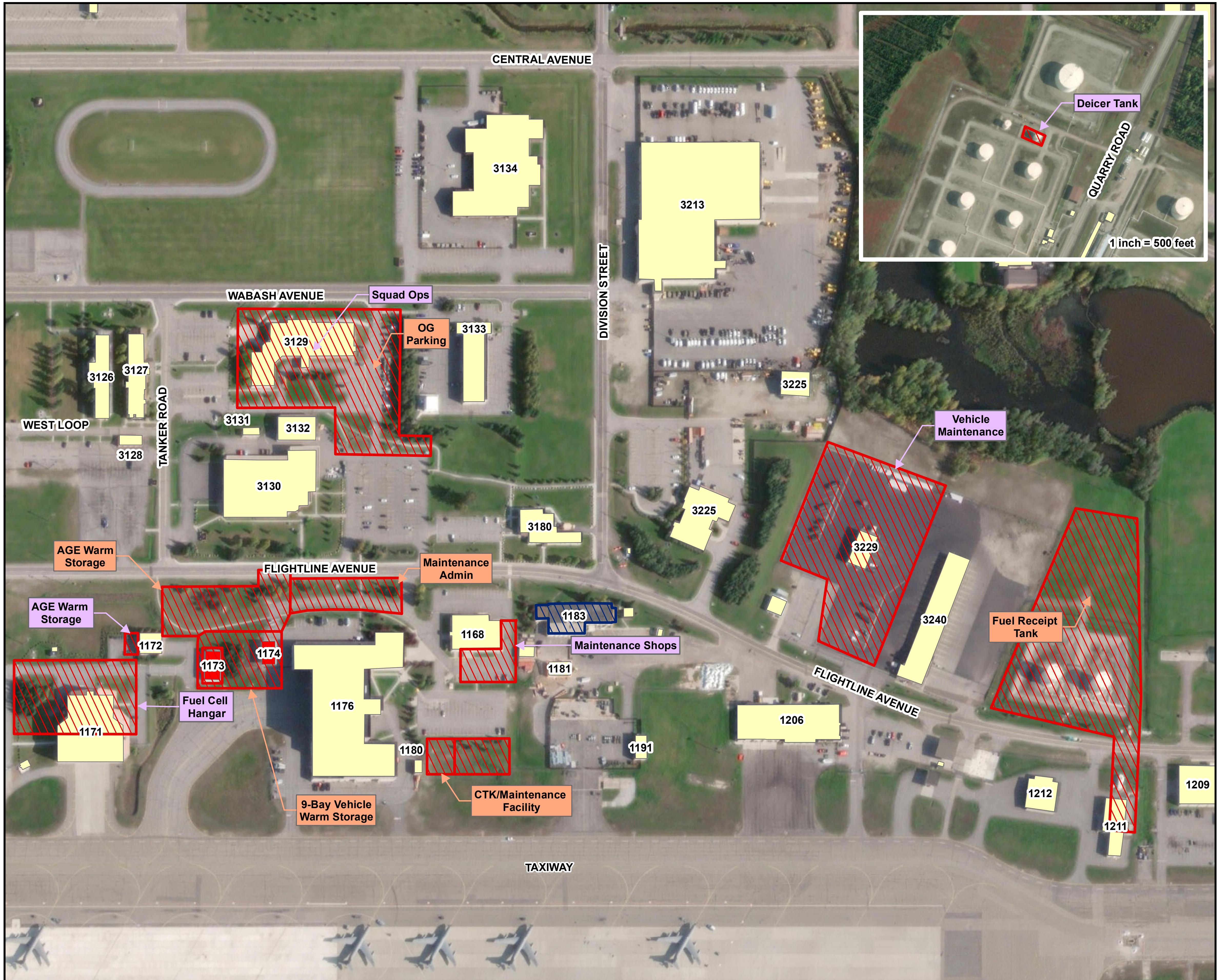
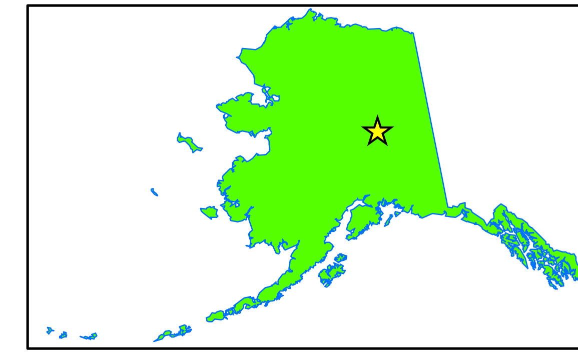
Attachment 2 Area of Potential Effect and Historic Properties

Attachment 1 Project Location



EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

SOUTHERN AREA OF POTENTIAL EFFECT AND HISTORIC PROPERTIES



New Construction

Refurbish/Renovation

Legend

- Historic Property
- Area of Potential Effect (new construction/renovation)
- Building
- Area of Potential Effect (demolition)

Abbreviations

AGE	Aerospace Ground Equipment
CTK	Composite Tool Kit
EA	Environmental Assessment
OG	Operations Group

Notes

1. Map produced using ESRI ArcMap v. 10.7.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2022. KC-135 Beddown & SATAF. Map prepared by 354 CES/CENPL. January.
3. Flightline Historic District Boundaries sourced from Eielson AFB. 2019. Integrated Cultural Resources Management Plan. March.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

260 130 0 260 520
SCALE IN FEET

1 INCH

PROJECT No.: 321004	DATE: 6/6/2022	FIGURE: 2
P.M.: M.V.	DRAWN: C.B.	

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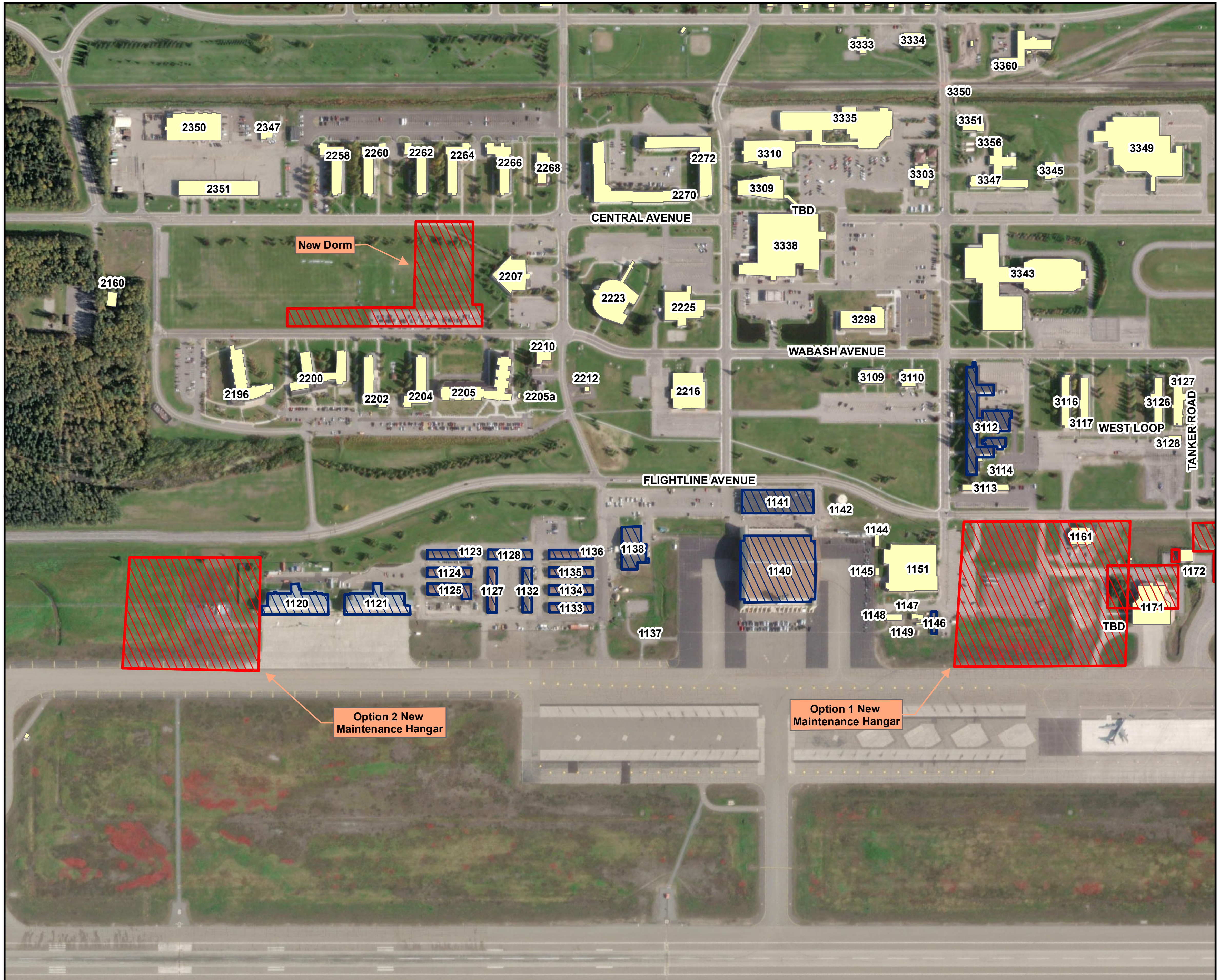
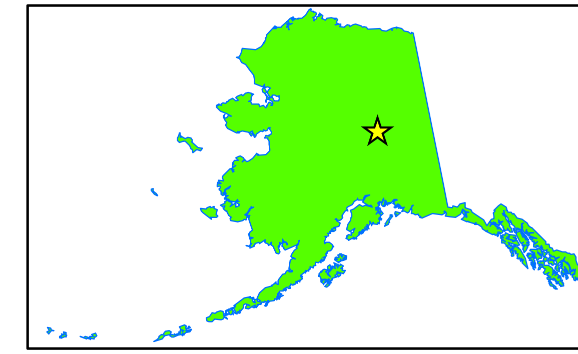


EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT

EIELSON AIR FORCE BASE, ALASKA

NORTHERN AREA OF POTENTIAL EFFECT AND HISTORIC PROPERTIES



New Construction

Legend

- Historic Property
- Building
- Area of Potential Effect (new construction/renovation)

Abbreviations

AHRS Alaska Heritage Resource Survey
EA Environmental Assessment

Notes

1. Map produced using ESRI ArcMap v. 10.7.
2. Location and footprint of Options 1 and 2 for New Maintenance Hangar are preliminary, approximate, and based on: 168 WG. 2022. 168th Wing Possible Hangar Locations, For Purpose of Add to EA/DOPAA. March 29.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2022. KC-135 Beddown & SATAF. Map prepared by 354 CES/CENPL. January.
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ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONTAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

450 225 0 450 900

SCALE IN FEET

PROJECT No.: 321004	DATE: 6/6/2022	FIGURE: 3
P.M.: M.V.	DRAWN: C.B.	

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From:	Hellmich, Amy S (DNR)
To:	BURKE, JAMIE L GS-11 USAF PACAF 354 CES/CEIE
Cc:	GUNDERSON, RONALD GS-12 USAF PACAF 354 CES/CEIEA
Subject:	[Non-DoD Source] KC-135 Stratotanker basing action
Date:	Monday, September 26, 2022 9:04:35 AM

3130-1R AF / 2022-01089

Good morning,

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated August 31, 2022) concerning the subject project on September 12, 2022. Following our review of the documentation provided, we concur with the finding of No Historic Properties Adversely Affected. Please note that our office may need to re-evaluate our concurrence if changes are made to the project's scope or design.

As stipulated in 36 CFR 800.3, other consulting parties such as the local government and Tribes are required to be notified of the undertaking. Additional information provided by the local government, Tribes, or other consulting parties may cause our office to re-evaluate our comments and recommendations. Please note that our response does not end the 30-day review period provided to other consulting parties.

Should unidentified historical or archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4), in consultation with our office. Please note that some resources can be deeply buried or underwater, and that fossils are considered cultural resources subject to the Alaska Historic Preservation Act.

This email serves as our office's official correspondence for the purposes of Section 106. Thank you for the opportunity to review and comment. Please contact me at (907) 269-8724 or amy.hellmich@alaska.gov <mailto:amy.hellmich@alaska.gov> if you have any questions or we can be of further assistance.

Best regards,

Amy Hellmich

Amy Hellmich

Review and Compliance – Architectural Historian II

Alaska State Historic Preservation Office

Office of History and Archaeology

550 West 7th Avenue, Suite 1310

Anchorage, AK 99501-3561

Direct: (907) 269-8724

amy.hellmich@alaska.gov <mailto:amy.hellmich@alaska.gov>

http://dnr.alaska.gov/parks/oha

Teleworking – Email is the best method of communication.

TRIBAL CONSULTATION

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Ms. Tracy Charles-Smith
President
Village of Dot Lake
PO Box 70494
Fairbanks AK 99707
Phone: (907) 882-5558

Dear President Charles-Smith

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; Fairbanks North Star Borough [FNSB] 2021). The undertaking would represent a 4.7% increase in the installation population.

The undertaking is estimated to increase the installation's KC-135 annual operations by 200%. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. A change in airspace is not included in the undertaking. The undertaking would have associated construction, demolition, and renovation projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. Attachment 2 shows facilities development associated with the undertaking.

New facilities to be constructed include:

- Aerospace Ground Equipment (AGE) Warm Storage (7,500 SF)
- 9-Bay Vehicle Warm Storage (9,000 SF)
- CTK/Maintenance Storage (4,500 SF)
- Maintenance Admin (4,000 SF)
- OG Parking (16,100 SF)
- Fuel Receipt Tank (26,000 SF)
- 96-Man Dormitory (18,500 SF)
- 96-Man Dormitory Parking (38,000 SF)
- 96-Man Dormitory Fire Lane (10,000 SF)
- Maintenance Hangar (188,000 SF)

Facilities to be demolished are:

- Bldg 1173 Tug & De-icer Warm Storage (7,500 SF)
- Bldg 1174 Refueling Pump Station (7,500 SF)

Facilities to be renovated include:

- Bldg 1168 Maintenance (8,500 SF)
- Bldg 1171 Fuel Cell Hangar (5,000 SF)
- Bldg 1172 AGE Warm Storage (4,686 SF)
- Bldg 3129 Squad Ops (15,200 SF)
- Bldg 3229 Fuel/Fire Vehicle Maintenance (6,800 SF)
- De-icer tank (Bldg 6260) (0 SF)

Area of Potential Effect

The Area of Potential Effect (APE) for this undertaking is the specific area of disturbance associated with proposed facility construction, demolition and renovation as shown in Attachment 2. For architectural resources, the APE includes a buffer to account for auditory or visual impacts. The APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active Air Force base, this buffer should capture all locations from which individual project construction or demolition activity may be visible or audible. As there would be no geographic expansion of flight patterns, airspace use, or air operations, the APE for this analysis does not include airspace. The APE is found on U.S. Geological Survey (USGS) topographic map FAI C-1 (Fairbanks Meridian), Township 3S, Range 3E, Sections 11 and 13.

Identification of Historic Properties

Eielson AFB has conducted both archaeological and architectural surveys within the APE (Eielson AFB 2019) and determined that no archaeological sites are present. Adjacent to the undertaking's APE is the Eielson AFB Flightline Historic District, which consists of 19 contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the KC-135 basing action. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Village of Dot Lake.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:38:57 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

Eielson Air Force Base (Eielson AFB). 2019. Integrated Cultural Resources Management Plan, Eielson Air Force Base. March.

Eielson AFB. 2021. Eielson-FNSB Housing Snapshot. Unclassified briefing prepared by Eielson AFB. September.

Fairbanks North Star Borough (FNSB). 2021. Community Research Quarterly: A Socio-Economic Review. Vol XLIV, No.2. Summer.

DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mrs. Patricia MacDonald
Council President
Healy Lake Village
600 University Avenue, Suite 100
Fairbanks AK 99709
Phone: (907) 388-7763

Dear President MacDonald

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

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contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

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If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:43:21 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. Tim McManus
President
Nenana Native Association
PO Box 369
Nenana AK 99760
Phone: (907) 832-1077

Dear President McManus

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

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If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:40:48 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

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October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. William Albert
President
Northway Village
PO Box 516
Northway AK 99764
Phone: (907) 778-2311

Dear President Albert

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

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- Bldg 1168 Maintenance (8,500 SF)
- Bldg 1171 Fuel Cell Hangar (5,000 SF)
- Bldg 1172 AGE Warm Storage (4,686 SF)
- Bldg 3129 Squad Ops (15,200 SF)
- Bldg 3229 Fuel/Fire Vehicle Maintenance (6,800 SF)
- De-icer tank (Bldg 6260) (0 SF)

Area of Potential Effect

The Area of Potential Effect (APE) for this undertaking is the specific area of disturbance associated with proposed facility construction, demolition and renovation as shown in Attachment 2. For architectural resources, the APE includes a buffer to account for auditory or visual impacts. The APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active Air Force base, this buffer should capture all locations from which individual project construction or demolition activity may be visible or audible. As there would be no geographic expansion of flight patterns, airspace use, or air operations, the APE for this analysis does not include airspace. The APE is found on U.S. Geological Survey (USGS) topographic map FAI C-1 (Fairbanks Meridian), Township 3S, Range 3E, Sections 11 and 13.

Identification of Historic Properties

Eielson AFB has conducted both archaeological and architectural surveys within the APE (Eielson AFB 2019) and determined that no archaeological sites are present. Adjacent to the undertaking's APE is the Eielson AFB Flightline Historic District, which consists of 19

contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the KC-135 basing action. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to Northway Village.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:39:56 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

Eielson Air Force Base (Eielson AFB). 2019. Integrated Cultural Resources Management Plan, Eielson Air Force Base. March.

Eielson AFB. 2021. Eielson-FNSB Housing Snapshot. Unclassified briefing prepared by Eielson AFB. September.

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October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. Herbert Demit
President
Native Village of Tanacross
PO Box 76009
Tanacross AK 99776
Phone: (907) 883-5024
Email: Jerr_isaac@hotmail.com

Dear President Demit

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; Fairbanks North Star Borough [FNSB] 2021). The undertaking would represent a 4.7% increase in the installation population.

The undertaking is estimated to increase the installation's KC-135 annual operations by 200%. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. A change in airspace is not included in the undertaking. The undertaking would have associated construction, demolition, and renovation projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. Attachment 2 shows facilities development associated with the undertaking.

New facilities to be constructed include:

- Aerospace Ground Equipment (AGE) Warm Storage (7,500 SF)
- 9-Bay Vehicle Warm Storage (9,000 SF)
- CTK/Maintenance Storage (4,500 SF)
- Maintenance Admin (4,000 SF)
- OG Parking (16,100 SF)
- Fuel Receipt Tank (26,000 SF)
- 96-Man Dormitory (18,500 SF)
- 96-Man Dormitory Parking (38,000 SF)
- 96-Man Dormitory Fire Lane (10,000 SF)
- Maintenance Hangar (188,000 SF)

Facilities to be demolished are:

- Bldg 1173 Tug & De-icer Warm Storage (7,500 SF)
- Bldg 1174 Refueling Pump Station (7,500 SF)

Facilities to be renovated include:

- Bldg 1168 Maintenance (8,500 SF)
- Bldg 1171 Fuel Cell Hangar (5,000 SF)
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No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the KC-135 basing action. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Native Village of Tanacross.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946
Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:41:48 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

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October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. Michael Sam
President
Native Village of Tetlin
PO Box 797
Tok AK 99780
Phone: (907) 883-2021

Dear President Sam

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; Fairbanks North Star Borough [FNSB] 2021). The undertaking would represent a 4.7% increase in the installation population.

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and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. Attachment 2 shows facilities development associated with the undertaking.

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- Maintenance Hangar (188,000 SF)

Facilities to be demolished are:

- Bldg 1173 Tug & De-icer Warm Storage (7,500 SF)
- Bldg 1174 Refueling Pump Station (7,500 SF)

Facilities to be renovated include:

- Bldg 1168 Maintenance (8,500 SF)
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- Bldg 1172 AGE Warm Storage (4,686 SF)
- Bldg 3129 Squad Ops (15,200 SF)
- Bldg 3229 Fuel/Fire Vehicle Maintenance (6,800 SF)
- De-icer tank (Bldg 6260) (0 SF)

Area of Potential Effect

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Identification of Historic Properties

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contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the KC-135 basing action. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Native Village of Tetlin.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:44:09 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

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Fairbanks North Star Borough (FNSB). 2021. Community Research Quarterly: A Socio-Economic Review. Vol XLIV, No.2. Summer.

DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. Aaron Schutt
President and CEO
Doyon, Limited
1 Doyon Place, Suite 300
Fairbanks AK 99701
Phone: (907) 375-4220

Dear President Schutt

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; Fairbanks North Star Borough [FNSB] 2021). The undertaking would represent a 4.7% increase in the installation population.

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Facilities to be renovated include:

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Eielson AFB has conducted both archaeological and architectural surveys within the APE (Eielson AFB 2019) and determined that no archaeological sites are present. Adjacent to the undertaking's APE is the Eielson AFB Flightline Historic District, which consists of 19 contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

NHPA requires that Federal agencies consult with tribes when an agency action might affect historic properties of religious and cultural significance to the tribes. In order to help us fulfill that obligation, I ask for your assistance in identifying any such properties on Eielson AFB and within the project's APE that are of significance to Doyon, Limited. 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.

Eielson AFB does not know of any historic properties of religious and cultural significance to Doyon, Limited on 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 respond and indicate whether you will be providing information or would like to consult on this undertaking. If you choose not to consult at this time, you will not be prevented from choosing to consult in the future. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946
Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:45:11 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

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October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Dr. Jessica Black
President
Fairbanks Native Association
3830 Cushman Street, Suite 100
Fairbanks, AK 99701
Phone: (907) 452-1648

Dear President Black

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

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No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

NHPA requires that Federal agencies consult with tribes when an agency action might affect historic properties of religious and cultural significance to the tribes. In order to help us fulfill that obligation, I ask for your assistance in identifying any such properties on Eielson AFB and within the project's APE that are of significance to the Fairbanks Native Association. 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.

Eielson AFB does not know of any historic properties of religious and cultural significance to the Fairbanks Native Association on 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 respond and indicate whether you will be providing information or would like to consult on this undertaking. If you choose not to consult at this time, you will not be prevented from choosing to consult in the future. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946
Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:46:13 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

Eielson Air Force Base (Eielson AFB). 2019. Integrated Cultural Resources Management Plan, Eielson Air Force Base. March.

Eielson AFB. 2021. Eielson-FNSB Housing Snapshot. Unclassified briefing prepared by Eielson AFB. September.

Fairbanks North Star Borough (FNSB). 2021. Community Research Quarterly: A Socio-Economic Review. Vol XLIV, No.2. Summer.

DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

October 10, 2022

Colonel David J. Berkland
Commander
354th Fighter Wing
354 Broadway Street Unit 19A
Eielson AFB AK 99702

Mr. Brian Ridley
President
Tanana Chiefs Conference
Chief Peter John Tribal Building
122 1st Ave.
Fairbanks AK 99701
Phone: (907) 452-8251

Dear President Ridley

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (Attachment 1). Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is accounting for various environmental concerns and engaging early with tribal governments as it develops this undertaking.

The Undertaking

The stationing of four additional KC-135s would result in 12 total KC-135 assigned to Eielson AFB. All four additional KC-135 would be "primary" aircraft and authorized for mission performance; they would not be considered "back-up" aircraft. The aircraft would be stationed at the installation in phases, with the first aircraft arriving in FY23. As part of the proposed undertaking, a total of 254 supporting active-duty personnel would accompany the additional KC-135s. It is assumed that all incoming personnel associated with the undertaking would be accompanied by dependents at an average of 1 dependent per active-duty personnel, resulting in a total of 508 personnel and dependents that would accompany the KC-135s. The population at Eielson AFB is 2,981 active-duty personnel (as of September 2021; Eielson AFB 2021), and 3,270 military family members (as of March 2021; Fairbanks North Star Borough [FNSB] 2021). The undertaking would represent a 4.7% increase in the installation population.

The undertaking is estimated to increase the installation's KC-135 annual operations by 200%. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. A change in airspace is not included in the undertaking. The undertaking would have associated construction, demolition, and renovation projects to provide the necessary infrastructure to support the incoming aircraft and personnel. Construction would generate a temporary area of disturbance of approximately 378,236 square feet (SF) and would increase the total impervious surface on the installation by approximately 361,786 SF. Attachment 2 shows facilities development associated with the undertaking.

New facilities to be constructed include:

- Aerospace Ground Equipment (AGE) Warm Storage (7,500 SF)
- 9-Bay Vehicle Warm Storage (9,000 SF)
- CTK/Maintenance Storage (4,500 SF)
- Maintenance Admin (4,000 SF)
- OG Parking (16,100 SF)
- Fuel Receipt Tank (26,000 SF)
- 96-Man Dormitory (18,500 SF)
- 96-Man Dormitory Parking (38,000 SF)
- 96-Man Dormitory Fire Lane (10,000 SF)
- Maintenance Hangar (188,000 SF)

Facilities to be demolished are:

- Bldg 1173 Tug & De-icer Warm Storage (7,500 SF)
- Bldg 1174 Refueling Pump Station (7,500 SF)

Facilities to be renovated include:

- Bldg 1168 Maintenance (8,500 SF)
- Bldg 1171 Fuel Cell Hangar (5,000 SF)
- Bldg 1172 AGE Warm Storage (4,686 SF)
- Bldg 3129 Squad Ops (15,200 SF)
- Bldg 3229 Fuel/Fire Vehicle Maintenance (6,800 SF)
- De-icer tank (Bldg 6260) (0 SF)

Area of Potential Effect

The Area of Potential Effect (APE) for this undertaking is the specific area of disturbance associated with proposed facility construction, demolition and renovation as shown in Attachment 2. For architectural resources, the APE includes a buffer to account for auditory or visual impacts. The APE for indirect effects is defined as a 1,000-foot buffer around project elements. Given the auditory and visual environment of an active Air Force base, this buffer should capture all locations from which individual project construction or demolition activity may be visible or audible. As there would be no geographic expansion of flight patterns, airspace use, or air operations, the APE for this analysis does not include airspace. The APE is found on U.S. Geological Survey (USGS) topographic map FAI C-1 (Fairbanks Meridian), Township 3S, Range 3E, Sections 11 and 13.

Identification of Historic Properties

Eielson AFB has conducted both archaeological and architectural surveys within the APE (Eielson AFB 2019) and determined that no archaeological sites are present. Adjacent to the undertaking's APE is the Eielson AFB Flightline Historic District, which consists of 19 contributing elements (18 buildings and 1 structure – the airfield runway) and is registered as FAI-01584 with the Alaska Heritage Resource Survey (AHRS). The District played a central role in bomber deployment and arctic observation missions during the Cold War period between 1947 and 1960. These missions were central to U.S. strategy regarding worldwide nuclear proliferation, national defense, nuclear strikes, and retaliation. The USAF determined the Flightline Historic District as eligible for the National Register of Historic Places (NRHP) under Criteria A, with Alaska SHPO concurrence in 2002 (Eielson AFB 2019).

No archaeological or traditional Tribal properties have been identified within the APE. Ground-disturbing activities would occur in previously disturbed areas in the main base area, and it is highly unlikely that any previously undocumented archaeological resources would be encountered during facility construction, demolition, and renovation. In the event of an unanticipated or inadvertent discovery, USAF would comply with Section 106 of the NHPA, as specified in standard operating procedures described in the Eielson AFB Integrated Cultural Resources Management Plan.

NHPA requires that Federal agencies consult with tribes when an agency action might affect historic properties of religious and cultural significance to the tribes. In order to help us fulfill that obligation, I ask for your assistance in identifying any such properties on Eielson AFB and within the project's APE that are of significance to the Tanana Chiefs Conference. 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.

Eielson AFB does not know of any historic properties of religious and cultural significance to the Tanana Chiefs Conference on 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 respond and indicate whether you will be providing information or would like to consult on this undertaking. If you choose not to consult at this time, you will not be prevented from choosing to consult in the future. Your choice applies only to providing information and consultations under the NHPA. It will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions, please contact Captain Faith Hirschmann, 354 FW/PA, at 354fw.pa.publicaffairs@us.af.mil or (907) 377-2116 or Amanda Gallagher, 354 CES/CEIE, at amanda.gallagher.5@us.af.mil or (907) 377-5643. Thank you in advance for your assistance in this effort.

Sincerely,

BERKLAND.DAVID.J.1146964946

Digitally signed by BERKLAND.DAVID.J.1146964946
Date: 2022.10.30 12:48:50 -08'00'

DAVID J. BERKLAND, Colonel, USAF
Commander

2 Attachments:
1. Project Location
2. Area of Potential Effect

cc:
PACAF/A4/A6/A7

References

Eielson Air Force Base (Eielson AFB). 2019. Integrated Cultural Resources Management Plan, Eielson Air Force Base. March.

Eielson AFB. 2021. Eielson-FNSB Housing Snapshot. Unclassified briefing prepared by Eielson AFB. September.

Fairbanks North Star Borough (FNSB). 2021. Community Research Quarterly: A Socio-Economic Review. Vol XLIV, No.2. Summer.

U.S. ARMY CORPS OF ENGINEERS CONSULTATION

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

August 31, 2022

Jamie Burke
NEPA Program Manager
354 CES/CEIE
2310 Central Avenue, Suite 100
Eielson AFB AK 99702

U.S. Army Corps of Engineers – Alaska District
Attn: Regulatory Branch
P.O. Box 35066
Fort Wainwright AK 99703

Dear Sir or Ma'am:

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing action of four additional KC-135 aircraft at Eielson Air Force Base (AFB), Alaska (the Proposed Action). Pursuant to Section 404 of the Clean Water Act (CWA), 33 U.S.C. §§ 1251-1387), to determine the baseline (current existing conditions) extent of wetlands and waters within the KC-135 Redistribution Project study area, a wetlands delineation was conducted in September 2021. Results from the field data collection were mapped in accordance with the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987[1]) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (2007 Supplement; USACE 2007[2]). Complete results are presented in Attachment 1, *Final Preliminary Jurisdictional Determination Report, Eielson Air Force Base KC-135 Redistribution Project*. Attachments 2, 3, and 4 present the general project vicinity, and the proposed projects associated with the Proposed Action.

The results of the field-verified mapping show waters account for 7.69 acres (5 percent) of the study area. No wetlands were found within the study area. All waters were classified in the Cowardin system (Cowardin et al. 1979[3]) as Freshwater Pond. For these reasons, we conclude that implementation of the Proposed Action or the No Action Alternative *will have no effect* on wetlands. The USAF respectfully requests concurrence with this determination in compliance with Section 404 of the CWA. When complete, copies of the draft EA will be forwarded for your review.

---

[1] USACE. Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Waterways Experiment Station, Vicksburg MS.
[2] USACE. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region, (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-07-24. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September
[3] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

If you have any questions or concerns, please contact Ronald Gunderson, Natural/Cultural Resources Manager, 354 CES/CEIEA, at ronald.gunderson@us.af.mil or (907) 377-5182. Please provide written comments, concurrence, or other information regarding the action, within 30 days from receipt of this letter, if possible. Thank you in advance for your assistance in this effort.

Sincerely,

BURKE.JAMIE.LYN.1604772067 Digitally signed by BURKE.JAMIE.LYN.1604772067 Date: 2022.09.02 15:58:04 -08'00'

JAMIE BURKE, GS-11, DAF

4 Attachments:
1. Final Preliminary Jurisdictional Determination Report, Eielson Air Force Base KC-135 Redistribution Project
2. Figure 1 Site Location and Vicinity
3. Figure 2 Proposed Construction, Renovation, and Demolition at Eielson Air Force Base
4. Figure 3 Proposed New Maintenance Hangar and New Dorm at Eielson Air Force Base
5. Request for Corps Jurisdictional Determination (JD) Form

cc:
PACAF/A4/A6/A7

Attachment 1. Final Preliminary Jurisdictional Determination Report, Eielson Air Force Base KC-135 Redistribution Project

Final Preliminary Jurisdictional Determination Report

Eielson Air Force Base KC-135 Redistribution Project

February 15, 2022

Prepared for:

Brice Engineering
3700 Centerpoint West, Suite 8223
Anchorage, AK 99503

Prepared by:

Stantec Consulting Services, Inc.
725 East Fireweed Lane Suite 200
Anchorage, Alaska 99503

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Executive Summary

This 2021 Preliminary Jurisdictional Determination Report presents the findings of the baseline (current existing conditions) extent of wetlands and waters within the KC-135 Redistribution Project study area for Brice Engineering.

The 2021 study area wetland mapping is based on the criteria in the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (USACE 2007), and the 2020 National Wetland Plant List (USACE 2020).

The results of the field verified mapping shows waters account for 7.69 acres (5 percent) of the study area. No wetlands were found within the study area.

Project Study Area: Waters of the U.S. Determination

Status	Acres	Percent of Study Area
Waters	7.69	5
Upland (Non-wetlands)	134.49	95
Total Study Area	**142.18**	**100**

All waters were classified in the Cowardin system (Cowardin et al. 1979) as Freshwater Pond.

Abbreviations

2007 Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)
APT	Antecedent Precipitation Tool
FVP	Field Verification Point
GPS	Global Positioning System
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
Stantec	Stantec Consulting Services Inc.
study area	KC-135 Redistribution Project study area
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WB	Waterbody Point
WD	Wetland Determination Point
WOUS	Waters of the U.S.

1.0 INTRODUCTION

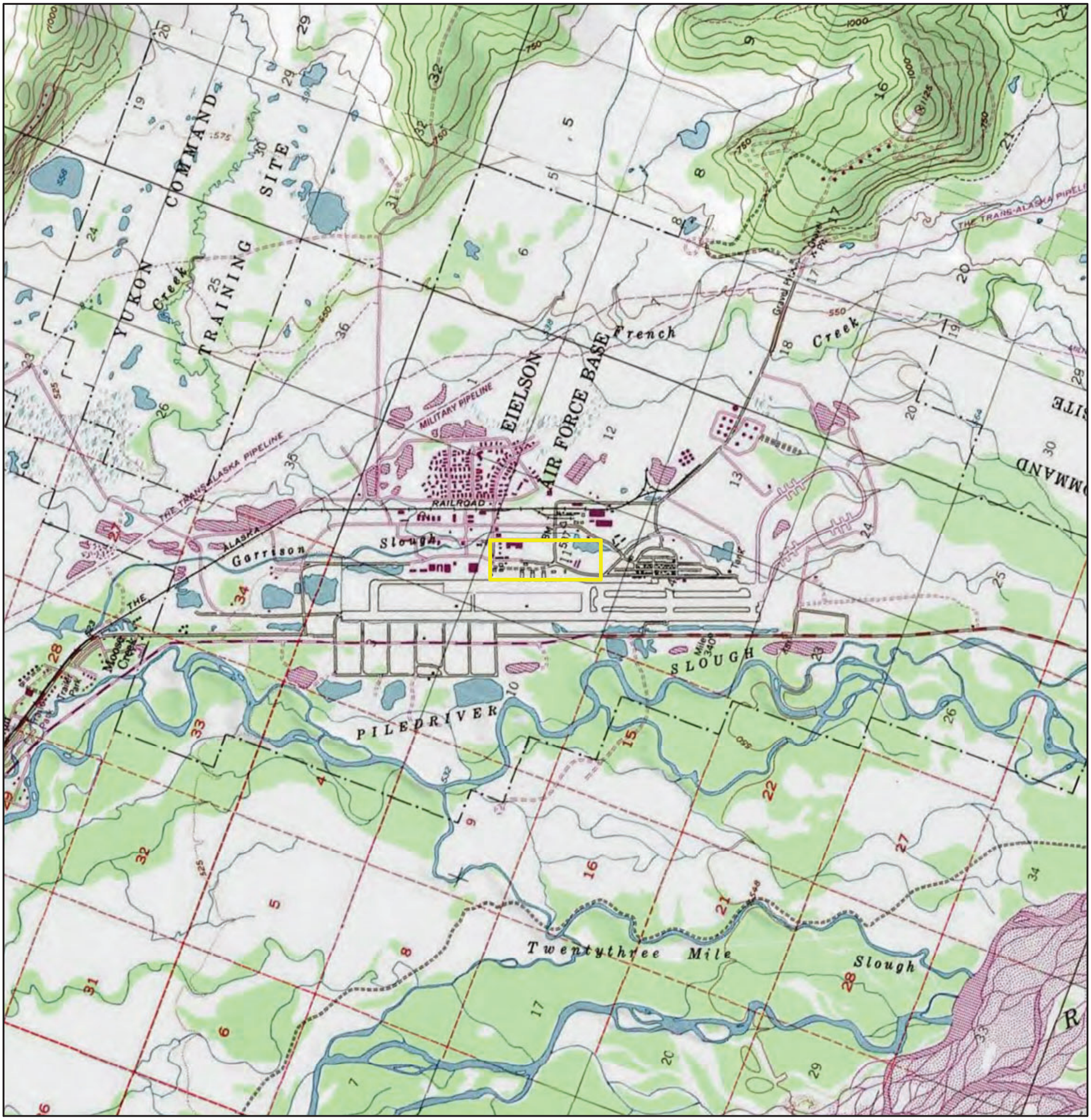
Stantec Consulting Services Inc. (Stantec) has determined the baseline status of the 142.2-acre KC-135 Redistribution Project study area (study area) for Brice Engineering. Stantec conducted field work to determine the extent of wetlands and waters. The study area is located within Eielson Air Force Base, Alaska.

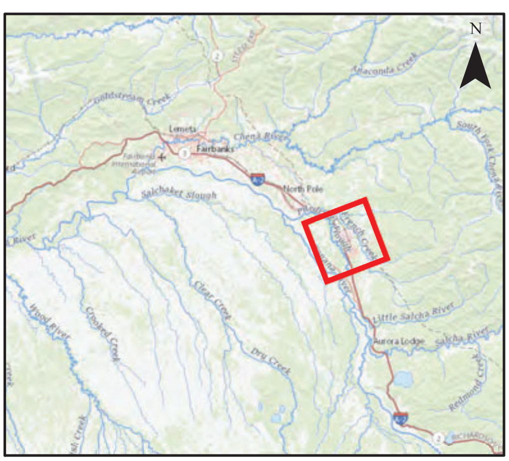
This Preliminary Jurisdictional Determination Report provides the baseline data necessary to determine the total Waters of the U.S. (WOUS) within the study area.

The field team collected field data including wetland determinations in September 2021. The results were mapped in accordance with the U.S. Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (2007 Supplement; USACE 2007). This Report also meets the guidelines set forth in Special Public Notice 2020-00399 (USACE 2020), Consultant Supplied Jurisdictional Determination Reports.

1.1 STUDY AREA LOCATION

The study area is located within the urban environments of Eielson Air Force Base, Alaska. The study area is in the Fairbanks C-1 NE United States Geological Survey (USGS) quadrangle, in the Fairbanks Meridian, and is in 1 Public Land Survey System section: Township 3S, 3E, Section 11. The latitude and longitude of the study area center is (WGS84, Decimal Degrees) 64.6691° N and 147.0907° W.





Study Area

0 0.5 1 Miles

(At original document size of 8.5x11)
1:63,360 1 in = 1 miles

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Project Location

Figure Number

1

Stantec

2.0 EXISTING DATA AND METHODOLOGY

2.1 EXISTING DATA

Sources of existing data used in developing baseline environmental data include: U.S. Department of Agriculture (USDA) ecoregion and soil survey information, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory wetland mapping, USGS project watersheds and stream data, and local climate data.

2.1.1 National Wetlands Inventory

The National Wetlands Inventory (NWI) on-line Wetlands Mapper (USFWS 2021a) shows the study area is covered by digital NWI data. Fairbanks area NWI mapping was most recently updated using 1997 Color Infrared aerial photography. Mapping was conducted at a scale of 1:30,000.

The NWI shows a Freshwater Pond in the northeast corner of the study area, with two Riverine (stream) components. A Freshwater Emergent Wetland is shown in the southern portion of the study area (Figure 2).

2.1.2 National Hydrography Dataset

The study area is within the Moose Creek – Tanana River USGS Hydrologic Unit Code 10 watershed (1908030710) (USGS 2021).

One National Hydrography Dataset-mapped stream flows through the study area in the same location as the NWI-mapped Riverine waters (USGS 2021).

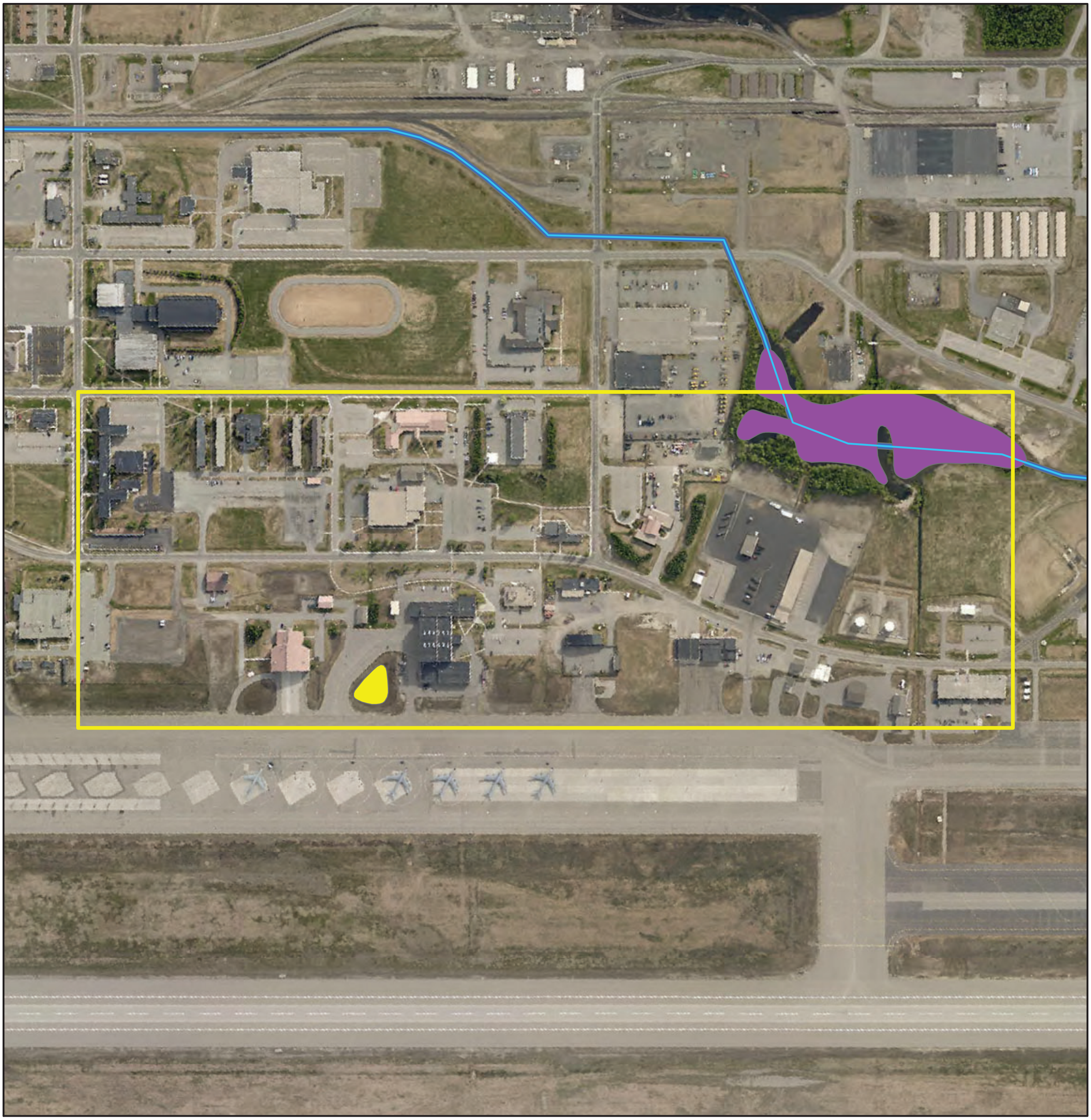
2.1.3 Soil Surveys

The Soil Survey of Fort Wainwright Area, Alaska (USDA 2006) covers the study area.

The study area falls within three map units (Table 1 and Figure 3). The table lists the potential hydric components for each of the map units.

Table 1: Soil Survey Units within the Study Area

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area	Percent Hydric Components
363	Jarvis-Salchaket complex	8.30	5.8	7
UC	Urban land-Typic Cryorthents complex, 0 to 2 percent slopes	127.13	89.4	0
W	Water	6.75	4.8	N/A
	Total	**142.18**	**100.0**	



Study Area

NHD Flowline

NWI Type

Freshwater Emergent Wetland

Freshwater Pond

Riverine

0 400 800 Feet

(At original document size of 8.5x11)

1:7,500 1 in = 625 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

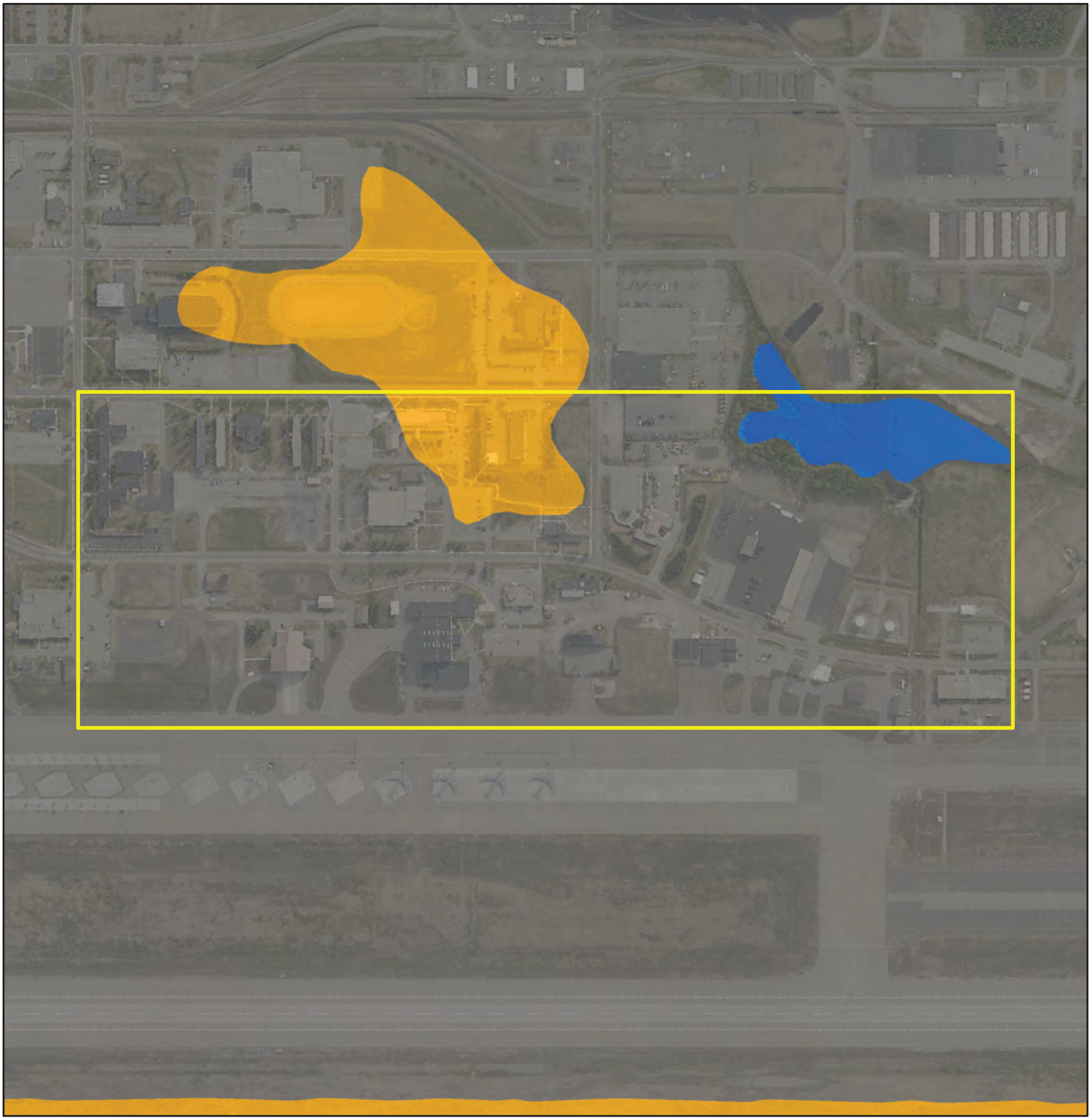
Figure

NWI and NHD Mapping

Figure Number

2

Stantec



Study Area

Soil Map Unit

Jarvis-Salchaket complex

Urban land-Typic Cryorthents complex, 0 to 2 percent slopes

Water

0 400 800 Feet

(At original document size of 8.5x11)
1:7,500 1 in = 625 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Soil Mapping

Figure Number

3

Stantec

2.1.4 Climate Data

The growing season for this area begins on May 3 and ends on October 3 (USACE 2007).

Precipitation data leading to 2021 field work is listed in Table 2. The weather conditions preceding the field investigations were considered during onsite determinations. Normal precipitation is based on 1981-2010 records for North Pole, Alaska (National Oceanic and Atmospheric Administration 2021). Field work was conducted September 22, 2021. Precipitation for the water year, starting October 2020, was 62 percent of normal (Table 2).

Table 2: 2021 Water Year WETS Precipitation for North Pole, Alaska

Month	Total Monthly Accumulated Precipitation (Inches)	Average Monthly Accumulated Precipitation 1981-2010 (Inches)	Percent of Average Precipitation	30% Chance Precipitation	
				Less Than (In.)	More Than (In.)
October 2020	0.48	0.93	52	0.56	1.12
November 2020	1.05	0.73	144	0.28	0.86
December 2020	0.15	0.70	21	0.27	0.84
January 2021	0.00	0.62	0	0.26	0.74
February 2021	0.97	0.48	202	0.14	0.55
March 2021	0.22	0.30	73	0.08	0.34
April 2021	1.13	0.37	305	0.00	0.28
May 2021	0..59	0.65	91	0.24	0.79
June 2021	1.34	1.57	85	0.97	1.90
July 2021	1.69	1.97	86	1.05	2.41
August 2021	3.74	2.01	186	1.26	2.42
September 2021	0.30	1.10	27	0.65	1.34
Total	**7.07**	**11.42**	**62**	**-**	**-**

These data suggest that conditions during field work were normal to drier than normal. The Antecedent Precipitation Tool (APT, EPA 2021) was also run for the study area and returned a value of Normal Conditions. The APT output is shown in Appendix A.

2.1.5 Threatened and Endangered Species

There are no threatened or endangered State or Federally listed species within the general area around the study area (USFWS 2021b).

2.2 METHODOLOGY

This section provides the methodology used during field data collection and digital mapping.

2.2.1 Field Data Collection

During the 2021 wetland field evaluations, Global Positioning System (GPS) locations and detailed information on plots (1/10) were recorded in representative project vegetation types. Additional field data, notes, and photographs were used to evaluate mapping areas with similar characteristics.

Field data was collected and recorded using three types of plots:

Wetland Determination (WD) Plots. At these sites, investigators recorded detailed descriptions of vegetation, hydrology, and soils on field data forms. Wetland status for this plot type was determined based on the presence or absence of hydrophytic vegetation, hydrology, and hydric soils (USACE 2007).

Field Verification Points (FVP). Photographs and GPS locations were taken for vegetation communities and landscape positions that were clearly wetland, water, or upland. If a wetland or water, Hydrogeomorphic (HGM) and Cowardin classifications were recorded.

Waterbody (WB) Points. Photographs and GPS locations were taken when ponds and lakes were encountered. Cowardin classifications were recorded.

Plant Data

Alaska is divided into subregions, where plant indicator statuses may differ from the rest of the State. The study area is within the National Wetland Plant List subregion Interior Alaska Lowlands. None of the six plants with indicator status changes were found on site. Plant indicator statuses are described in Appendix B. Plants were identified to the taxonomic level of species.

The presence of hydrophytic vegetation was determined using the prevalence index and the dominance test (USACE 2007).

Hydric Soils Assessment

Field indicators of hydric soils and determination of hydric soil status was based on USDA National Resource Conservation Service (NRCS) guidance (USDA 2018) and the 2007 Supplement (USACE 2007). The 2007 Supplement contains a subset of hydric soil indicators found in the U.S. as determined by the National Technical Committee for Hydric Soils (USACE 2007). Additional soil characteristics recorded within the soil horizons were based on NRCS guidance (Schoeneberger et al. 2012).

Hydrology

The 2007 Supplement lists numerous primary and secondary hydrology indicators. All indicators found in each sampling area were recorded in the data form.

Field Data

Field data were collected at 12 sites throughout the study area. All field data were entered into a project database where the data were reviewed; queries were generated from the database to provide the information needed for mapping and results analyses.

Field data was collected September 22, 2021 by Professional Wetland Scientist Steve Reidsma. Field plot types collected are shown in Table 3. Each 2021 field plot with photos is presented in Appendix C.

Table 3: Field Data Contributing to this Project

Field Plot Type	Wetlands and Waters	Uplands	Total Plots
Wetland Determination (WD)	0	1	1
Field Verification Point (FVP)	0	9	9
Waterbody (WB)	2	0	2
Total	**2**	**10**	**12**

2.2.2 Wetland Mapping

Final mapping (waters boundaries, Cowardin classification) was completed using 2-foot contour data and several years of aerial imagery collected by the Fairbanks North Star Borough (2012, 2017, and 2020) in ESRI's ArcMap GIS (10.8) environment.

Field data were used to identify the characteristics of wetlands or waters at a specific location. In addition to imagery interpretations, ancillary data including field notes, general landscape position, slope, and aspect were utilized in the mapping process.

Mapping polygons were drawn to delineate differences among the classification systems used to attribute wetlands and waters polygons. Delineation occurred at a scale of 1:600 (one-inch equals 50 feet).

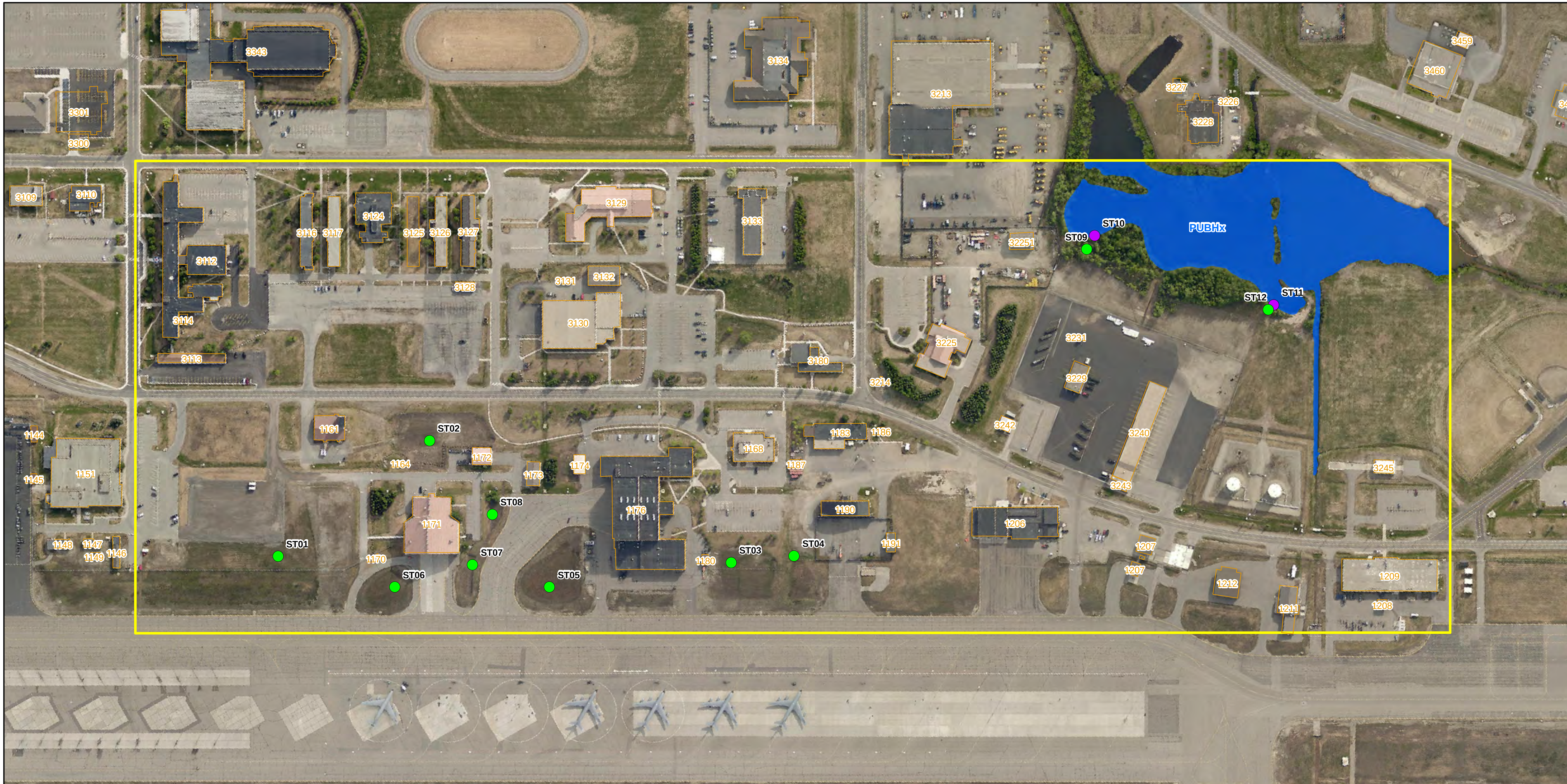
3.0 RESULTS

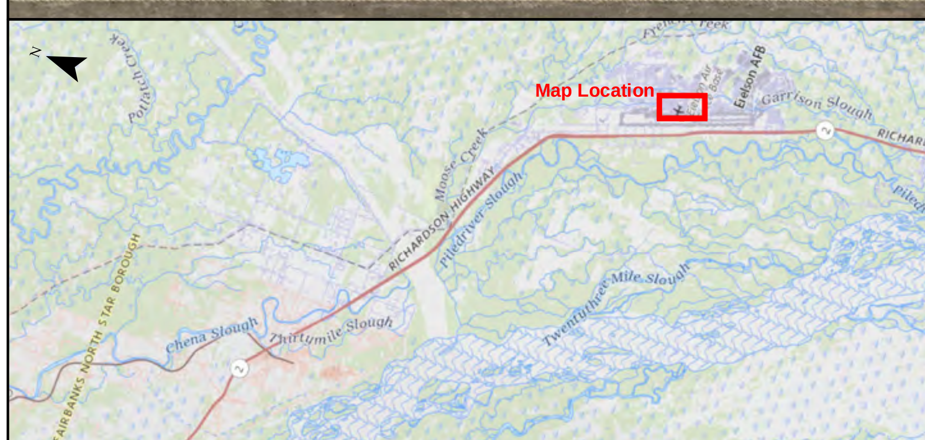
3.1 WETLANDS AND WATERS

The field verified wetlands and waters totals are summarized in Table 4. Figure 4 shows the waters in the study area. There were no wetlands found.

Table 4: Waters Within the Study Area

Status	Acres	Percent of Study Area
Waters	7.69	5
Uplands	134.49	95
Total Study Area	**142.18**	**100**





Study Area

Existing Structure (Labeled by Building ID)

Waterbody

Field Plot Type

Pond

Upland

Coordinate System: WGS 1984 UTM Zone 6N
Projection: Transverse Mercator
Datum: WGS 1984
Imagery: Fairbanks North Star Borough 2017
Key Map Background: USGSTopo

0 150 300 600 Feet

1:3,600 1 inch equals 300 feet

N E S W

Eielson Air Force Base
KC-135 Redistribution

Waters of the U.S. Delineation

Figure 4	10/5/21

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A freshwater pond connected to Garrison Slough was delineated in the northeast portion of the study area. A full wetland delineation (ST09) showed that the vegetated areas adjacent to the pond do not qualify as wetlands. The pond is an excavated feature with an abrupt upland and waters edge and was classified under the NWI system as PUBHx. The total acreage of the pond within the study area is 7.69 acres. A linear feature connected to the pond extends to the southwest towards the tarmac. A photograph of the pond is shown in Figure 5.

Figure 5: Pond

Depressions in the southern portion of the study area near the aircraft parking aprons were reviewed, including the area identified by the NWI as an excavated freshwater emergent wetland. These depressions were found to be water runoff collection basins and snow dumps. There was no evidence of dominant hydrophytic vegetation or wetland hydrology in these depressions (e.g., sediment deposits, water marks), and they appeared to be terminal and had no direct surface connection to WOUS nor each other. Current Environmental Protection Agency guidance was reviewed to determine if these features meet the pre-2015 regulatory definition of WOUS. The depressions are manmade features that do not qualify as WOUS under 40 CFR 230.3(s)(1-7). Photos from several of these features are shown in Figure 6.

Figure 6: Depression Features

3.1.1 Cowardin Classification

As part of the wetlands mapping, vegetation communities were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

Table 5 shows all waters in the study area are classified in the Cowardin system as Freshwater Pond, covering 7.69 acres of the study area.

Table 5: Cowardin Classifications for the Study Area

Cowardin Type	NWI Code	Waters Acres	Percent of Study Area	Percent of Waters
Waters				
Freshwater Pond	PUB	7.69	5	100
	Total Waters	**7.69**	**5**	**100**
	Total Uplands	**134.49**	**95**	
	Total Study Area	**142.18**	**100**	

3.1.2 Tributaries

The delineated pond is an excavation of Garrison Slough and has perennial inlet and outlet to the slough. Garrison Slough is a tributary to Moose Creek, which flows into Piledriver Slough, which flows into the Tanana River, a Traditional Navigable Water.

3.2 VEGETATION

The study area is part of the urban environment of Eielson Air Force Base and has been historically cleared, filled, and built. Non-paved areas are primarily characterized by mowed vegetation, landscaped trees or shrubs, or in some cases disturbance regrowth. The pond in the northeast was created by gravel mining; forested areas around the edge are disturbance regrowth.

Plant Species

Ten vascular plant species are included in the project plant list (Appendix B) and represent the species recorded at the WD plot (ST09), which was in a regrowth forest dominated by Balsam Poplar.

None of the species recorded in the study area are considered threatened or endangered (USFWS 2021b). Only one plant species is endangered in Alaska, *Polystichum aleuticum*, a small fern endemic to the Aleutian Islands, and is not expected to occur in the study area.

4.0 REFERENCES

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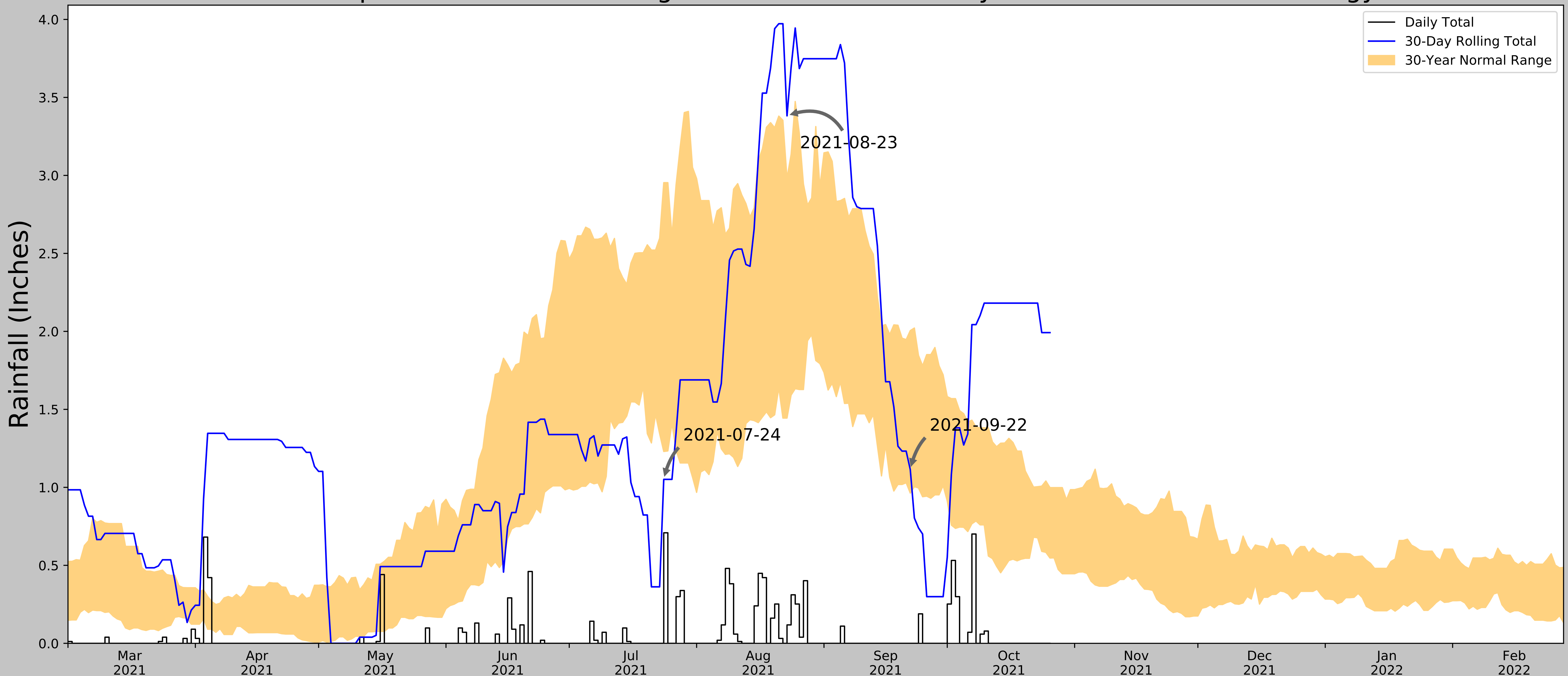
APPENDICES

Appendix A ANTECEDENT PRECIPITATION TOOL

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	64.67, -147.09
Observation Date	2021-09-22
Elevation (ft)	540.73
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-22	0.962992	2.005118	1.114173	Normal	2	3	6
2021-08-23	1.444095	2.981496	3.38189	Wet	3	2	6
2021-07-24	1.229921	2.953543	1.051181	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
N POLE	64.7581, -147.3253	475.066	9.234	65.664	4.762	11156	89
N POLE 1N	64.76, -147.34	496.063	0.453	20.997	0.213	78	1
MOOSE CREEK	64.7136, -147.1581	517.06	5.811	41.994	2.859	1	0
EIELSON FLD	64.6667, -147.1	546.916	9.17	71.85	4.785	68	0
AURORA	64.8553, -147.7217	442.913	13.455	32.153	6.487	43	0
Fairbanks F.O.	64.85, -147.8	450.131	15.339	24.935	7.285	7	0

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Appendix B PLANT LIST

Project study area plants recorded during Stantec field work in 2021.

Latin Name	Common Name[a]	Indicator Status Rating[a]
Tree		
Populus balsamifera	Balsam Poplar	FACU
Shrub/Sapling		
Arctostaphylos uva-ursi	Red Bearberry	UPL
Populus balsamifera	Balsam Poplar	FACU
Populus tremuloides	Quaking Aspen	FACU
Rosa acicularis	Prickly Rose	FACU
Salix bebbiana	Gray Willow	FAC
Shepherdia canadensis	Russet Buffalo-Berry	FACU
Herbaceous		
Calamagrostis canadensis	Bluejoint	FAC
Chamaenerion angustifolium	Narrow-Leaf Fireweed	FACU
Equisetum arvense	Field Horsetail	FAC
Orthilia secunda	Sidebells	FACU

Appendix C FIELD DATA FORMS AND PHOTOS

PHOTO REPORT

Plot Number	ST01
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 5:47:59 PM
NWI Classification	U
Latitude (DD)	64.672739
Longitude (DD)	-147.097385

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST02
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 5:54:06 PM
NWI Classification	U
Latitude (DD)	64.671872
Longitude (DD)	-147.094117

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST03
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 6:04:19 PM
NWI Classification	U
Latitude (DD)	64.669064
Longitude (DD)	-147.094253

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST04
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 6:08:23 PM
NWI Classification	U
Latitude (DD)	64.668577
Longitude (DD)	-147.093675

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST05
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 6:54:40 PM
NWI Classification	U
Latitude (DD)	64.670454
Longitude (DD)	-147.096018

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST06
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 6:59:52 PM
NWI Classification	U
Latitude (DD)	64.671704
Longitude (DD)	-147.097127

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST07
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 7:03:20 PM
NWI Classification	U
Latitude (DD)	64.671145
Longitude (DD)	-147.09615

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: NE

PHOTO REPORT

Plot Number	ST08
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 7:08:07 PM
NWI Classification	U
Latitude (DD)	64.671139
Longitude (DD)	-147.095059

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Alaska Region

Plot No: ST 09

Project:	Date: 9/22/21
Applicant: Brice	Investigators: SRC
Borough/City/Location: FAFB	

NAD 83, Decimal Degrees

STANTEC

Latitude: 64.66716	Watershed: HUC12 Garrison Slough-Moose Creek
Longitude: -147.085820	Location Notes:
Elevation (ft): 533	mounds of gravel nearby

SUMMARY OF FINDINGS

Are "Normal Circumstances" Present?			YES	Hydrophytic Vegetation Present?	NO
Significantly Disturbed?	VEG	SOILS	HYDRO	Hydric Soils Present?	NO
Naturally Problematic?	VEG	SOILS	HYDRO	Wetland Hydrology Present?	NO
Remarks:				**Is the Sampled Area within a Wetland?**	NO

VEGETATION T< 1%, P = Present **SUBREGION:**

Tree Stratum DBH ≥ 3 inch				1/10 acre circular plot unless noted, absolute cover recorded			
Species	**IND**	**DOM**	**Cover**	**Species**	**IND**	**DOM**	**Cover**
1. POPBAL	FU	Y	25	3.			
2.				4.			
Total Tree Cover: 25		**50% of Total Cover:** 12.5		**20% of Total Cover:** 5			
Sapling/Shrub Stratum	**IND**	**DOM**	**Cover**	8.			
1. POPBAL	FU	Y	35	9.			
2. ROSACI	FU	Y	20	10.			
3. POPTRE	FU	N	15	11.			
4. ~~VACVIT~~				12.			
5. ARCUVAURSI	UP	N	5	13.			
6. SALBEB	F	N	3	14.			
7. SHECAN	FU	N	T	15.			
Total Shrub Cover: 78		**50% of Total Cover:** 39		**20% of Total Cover:** 15.6			
Herbaceous Stratum	**IND**	**DOM**	**Cover**	13.			
1. CHAANG	FU	Y	3	14.			
2. EQUARV	F	N	T	15.			
3. CALCAN	F	Y	5	16.			
4. ORTSEC	FU	N	T	17.			
5.				18.			
6.				19.			
7.				20.			
8.				21.			
9.				22.			
10.				23.			
11.				24.			
12.				25.			
Total Herb Cover: 8		**50% of Total Cover:** 4		**20% of Total Cover:** 1.6			
1.Open Water				2. Bare ground			

Remarks: Bryophytes and Lichens may be listed in the Herbaceous columns

Soil

S

NE

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:
OBL species	-	x 1 =
FACW species	-	x 2 =
FAC species	8	x 3 = 24
FACU species	98	x 4 = 392
UPL species	5	x 5 = 25
Column Totals:	111 (A)	441 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

N Dominance Test is >50%

N Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1]

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Project Vegetation Type

CDF

Cowardin Code: U

HGM Classification: n/a

Landform: lowland - bench

Local Relief: flat

Microtopography:	Slope:	Aspect:
flat	—	100

SOIL

Plot No: ST 09

Profile Description: Describe to the depth needed to document the presence/absence of soil indicators | Soil Map Unit Name: -

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Type[1]	Color	%	Loc[2]	Mod[3]	Texture	Horizon Comments
1-0	Oi									
8-18	Bw	10YR 2.5/1	100					GR	SA	

[1]Type: C=Concentrations, D=Depletions, OX=Oxidized Roots, RM = Reduced Matrix [2]Location: PL=Pore Linings, RC=Root Channels, M=Matrix, CS=Coated Sand Grains

Remarks: previously dist., prior gravel pit area

[3]Texture Modifiers: Mucky (MK), Peaty (PT), Permafrost (PF) | Coarse Fragments: Gravelly (GR), Cobbly (CB), Stony (ST) (15-35%), 35-60% = Very (V), 60-90% = Extremely (X)

Hydric Soil Indicators Measure from the top of the mineral soil layer except for A1, A2, A3, A4

- N Histosol or Histel (A1)
- N Histic Epipedon (A2)[4]
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Thick Dark Surfaces (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Hydric Soils Present?	NO
NRCS Drainage Class:	MWD
Depth of Organic Soils:	1
Restrictive Layer Type:	—
Restrictive Layer Depth:	—

[4]Underlain by mineral soil w/chroma of ≤2

Indicators for Problematic Hydric Soils[5] (See Page 91/Section 4 for Problematic Hydric Soils Details)

- N Depleted Below Dark Surface (A11)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depression (F8)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Alaska Color Change (TA4) Give details of color change
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed w/o Hue 5Y or Redder Underlying
- N AA Positive (mineral soil, 60% of horizon 4 inches thick)
- N Ponded/Flooded/High Water Table (12 inches or higher)
- N Low Organic Matter/Low Iron/High pH Soil/New Wetland
- ___ Other (explain in remarks)

[5]Must have Hydrophytic Vegetation and Primary Hydrology, and an appropriate landscape position unless disturbed or problematic

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- N Dry-Season Water Table (C2)**
- N Other (Explain in Remarks)

Are Climatic/Hydrologic Conditions on Site Typical for this time of Year? yes

Secondary Indicators (2 or more required)

- N Water-stained Leaves (B9)
- N Drainage Patterns (B10)
- N Oxidized Rhizospheres along Living Roots (C3)(w/in 12")
- N Presence of Reduced Iron (C4)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", note as restrictive layer)
- N Microtopographic Relief (D4)
- N FAC-Neutral Test (D5)

Field Observations (inches from ground surface)

Surface Water Present? Yes ____ No X Depth (inches): ______

Water Table Present? Yes ____ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ______

Episaturation ______ Endosaturation ______

Water Source:

Wetland Hydrology Present? NO

Dry Season Water Table SC, Interior, Western AK:

Mid May – late July
**Mineral Soils 12-24 inches
**Organic Soils 12-40 inches

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FAC-Neutral Test = #OBL+FW dominants > #FU + UPL dominants; add non-dominants if tie

PHOTO REPORT

Plot Number	ST09
Wetland Status	Upland
Plot Type	WD
Plot Date	9/22/2021 8:09:16 PM
NWI Classification	U
Latitude (DD)	64.667159
Longitude (DD)	-147.085801

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST10
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021 8:02:28 PM
NWI Classification	PUBHx
Latitude (DD)	64.667137
Longitude (DD)	-147.085484

Photo Type: Hydrology Direction: E

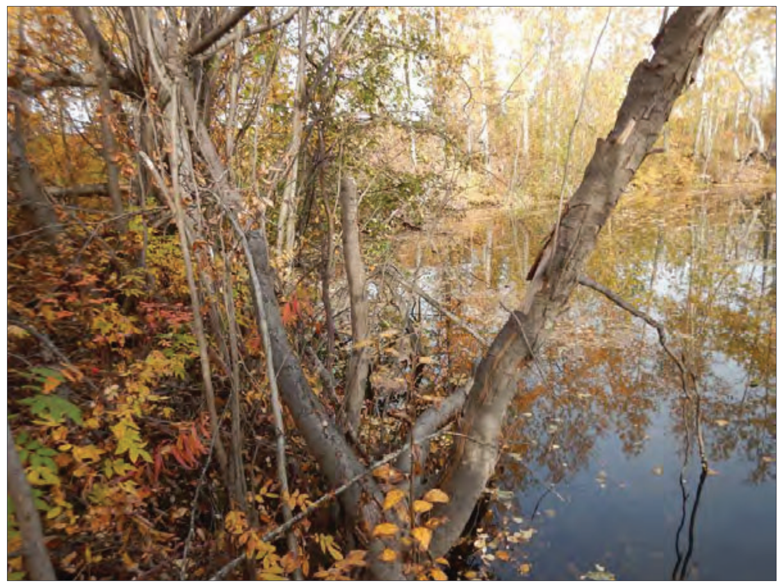


Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST11
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021 8:28:43 PM
NWI Classification	PUBHx
Latitude (DD)	64.665478
Longitude (DD)	-147.085506

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: SE

PHOTO REPORT

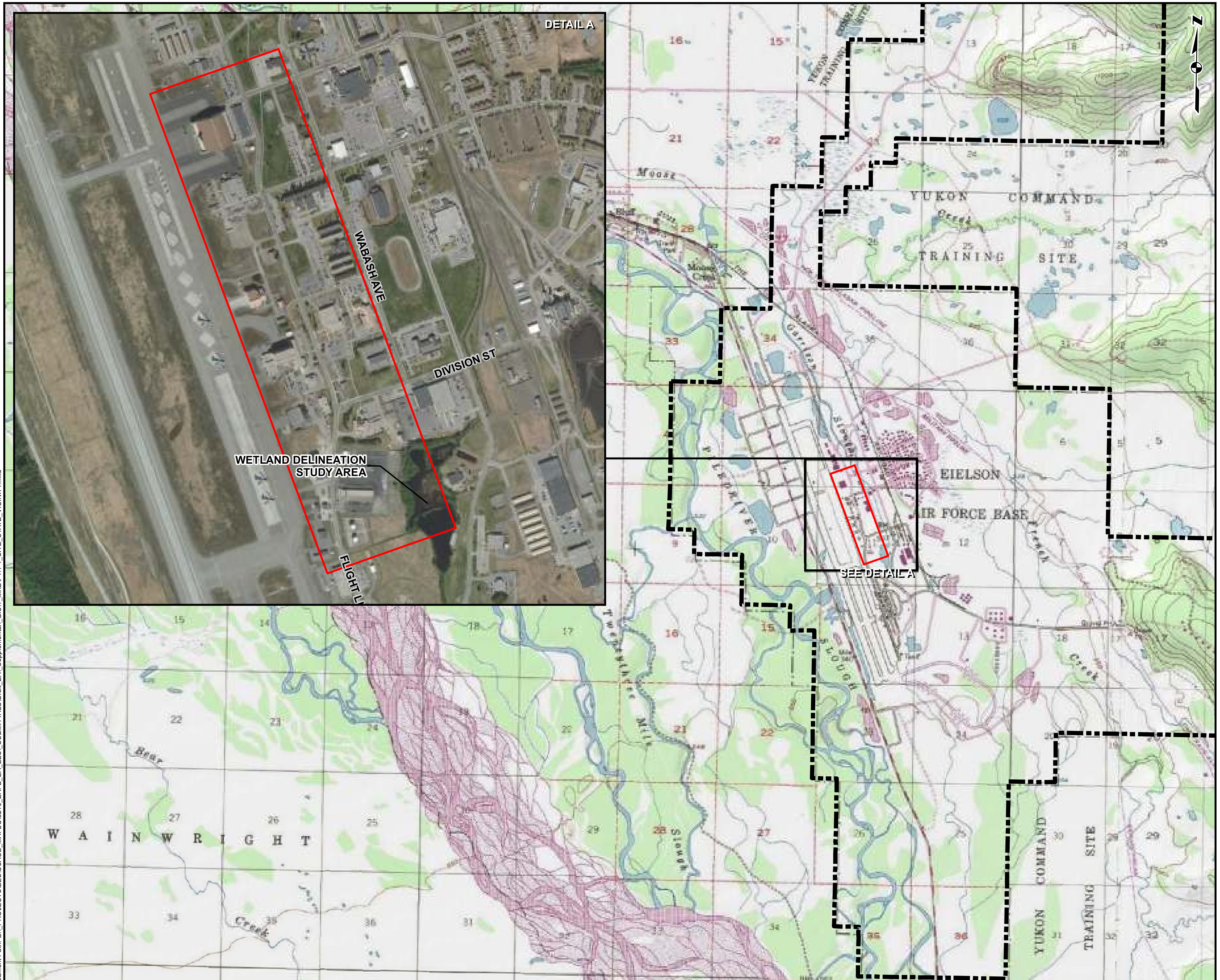
Plot Number	ST12
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021 8:31:15 PM
NWI Classification	U
Latitude (DD)	64.665507
Longitude (DD)	-147.085636

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

Attachment 2. Figure 1 Site Location and Vicinity



EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

SITE LOCATION AND VICINITY

Legend

Approximate Region of Influence

Installation Boundary

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

ALASKA STATE PLANE ZONE 3. U.S. SURVEY FEET
HORIZONAL DATUM: NAD83(2011) | VERTICAL DATUM: NAVD88

1 0.5 0 1 2
Miles

PROJECT No.: 321004	DATE: 4/18/2022	FIGURE: 1
P.M.: M.V.	DRAWN: J.C.	

Document Path: G:_PROJECTS\BES\USACE_MATOC\3210_EAFB_EA_EBS_SUBMITTALS\Draft_EA_Supplemental_GIS\1_MXD\F1.1-1_SITE_STATE_VICINITY.mxd

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Attachment 3. Figure 2 Proposed Construction, Renovation, and Demolition at Eielson Air Force Base

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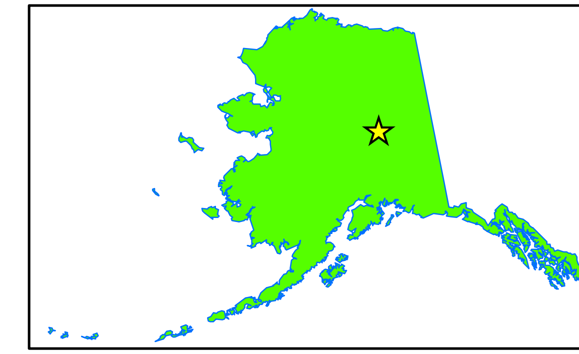
1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT
EIELSON AIR FORCE BASE, ALASKA

PROPOSED CONSTRUCTION, RENOVATION, AND DEMOLITION AT EIELSON AIR FORCE BASE



Legend

- Airfield Fence
- Utilidor
- 168 WG Parcel
- 354 FW Parcel
- Demo
- Building
- New Construction
- Refurbish/Renovation

Abbreviations

AGE	Aerospace Ground Equipment
CTK	Composite Tool Kit
EA	Environmental Assessment
OG	Operations Group

Notes

1. Map produced using ESRI ArcMap v. 10.7.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2022. *KC-135 Beddown & SATAF*. Map prepared by 354 CES/CENPL. January.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

260 130 0 260 520

SCALE IN FEET

PROJECT No.: 321004	DATE: 4/18/2022	FIGURE: 2
P.M.: M.V.	DRAWN: C.B.	

Attachment 4. Figure 3 Proposed New Maintenance Hangar and New Dorm at Eielson Air Force Base

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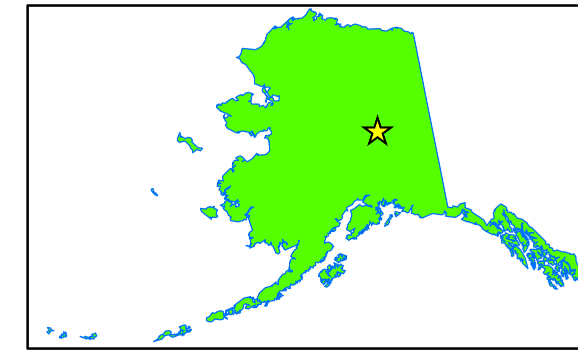
1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT

EIELSON AIR FORCE BASE, ALASKA

PROPOSED NEW MAINTENANCE HANGAR AND NEW DORM AT EIELSON AIR FORCE BASE



Legend

- Airfield Fence
- Utilidor
- 168 WG Parcel
- 354 FW Parcel
- Building

New Construction

Abbreviations

EA Environmental Assessment

Notes

1. Map produced using ESRI ArcMap v. 10.7.
2. Location and footprint of Options 1 and 2 for New Maintenance Hangar are preliminary, approximate, and based on: 168 WG. 2022. 168th Wing Possible Hangar Locations, For Purpose of Add to EA/DOPAA. March 29.

References

1. Imagery source: Vivid – Alaska (Aerial, 0.5m, collected on 5/18/2015)
2. Proposed project features sourced from Eielson AFB. 2022. *KC-135 Beddown & SATAF.* Map prepared by 354 CES/CENPL. January.
3. Proposed Maintenance Hangar options siting and extent are preliminary and approximate.

ALASKA STATE PLANE COORDINATE SYSTEM ZONE 3, U.S. SURVEY FEET
HORIZONTAL DATUM: NAD83 (2011) | VERTICAL DATUM: NAVD88

450 225 0 450 900

SCALE IN FEET

PROJECT No.: 321004	DATE: 4/19/2022	FIGURE: 3
P.M.: M.V.	DRAWN: C.B.	

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Attachment 5. Request for Corps Jurisdictional Determination (JD) Form

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REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: Alaska District

- I am requesting a JD on property located at (Street Address/Lot/Block/Subdivision/etc.): Flightline Avenue, Eielson Air Force Base, Alaska

City/Township/Parish: Eielson Air Force Base County: - State: AK

Acreage of Parcel/Review Area for JD: 142.2
Section: 11 Township: 003S Range: 003E

Latitude (decimal degrees): 64.668913 Longitude (decimal degrees): -147.090656
(For linear projects, please include the center point of the proposed alignment.)

- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ☐ I currently own this property. ☐ I plan to purchase this property.
  ☑ I am an agent/consultant acting on behalf of the requestor.
  ☐ Other (please explain):__________.
- Reason for request: (check as many as applicable)
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ☐ A Corps JD is required in order to obtain my local/state authorization.
  ☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ☑ I believe that the site may be comprised entirely of dry land.
  ☑ Other: Completion of an Environmental Assessment under NEPA
- Type of determination being requested:
  ☐ I am requesting an approved JD.
  ☐ I am requesting a preliminary JD.
  ☑ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: BURKE.JAMIE.LYN.1604772067 Digitally signed by BURKE.JAMIE.LYN.1604772067 Date: 2022.09.06 10:47:33 -08'00' Date: 9/6/2022

- Typed or printed name: Jamie Burke

  Company name: U.S. Air Force, Eielson Air Force Base

  Address: 2310 Central Ave, Suite 100
  Eielson AFB, AK 99702

  Daytime phone no.: 907-377-3313

  Email address: jamie.burke.3@us.af.mil

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

The **Alaska District Office** handles all areas not covered by the field offices listed below.

Alaska District Office
P.O. Box 6898
JBER, Alaska 99506-0898
907-753-2712
800-478-2712
Fax: 907-753-5567
Email: regpagemaster@usace.army.mil

The **Fairbanks Regulatory Field Office** is responsible for the Fairbanks North Star Borough, the Taylor Highway westward to the Parks Highway north of the Alaska Range, the Dalton Highway, and all military projects north of the Alaska Range, including the cities of Big Delta, Birch Creek, Central, Chena Hot Springs, Chicken, Circle, Circle Hot Springs, Delta Junction, Dot Lake, Dry Creek, Ester, Fairbanks, Fox, Healy, Healy Lake, Livengood, Manley Hot Springs, Minto, Nenana, North Pole, Rampart, Tanacross, and Tok.

Fairbanks Regulatory Field Office 2175
University Avenue, Suite #201E
Fairbanks, Alaska 99709
907-474-2166
Fax: 907-474-2164
Email: regpagemaster@usace.army.mil

The **Juneau Regulatory Field Office** is responsible for projects located in southeast Alaska, from Cape Suckling south to Cape Fanshaw, Admiralty Island, Chichagof and Baranof Islands. Communities include Angoon, Gustavus, Haines, Juneau, Klukwan, Skagway, Elfin Cove, Hoonah, Pelican, Port Alexander, Sitka, and Tenakee Springs, and Yakutat.

Mailing Address:

U.S. Army Corps of Engineers-Alaska District
CEPOA-RD, Juneau Field Office
P.O. Box 22270
Juneau, Alaska 99802-9998

Physical Address:

Hurff A. Saunders Federal Building
709 W. 9th Street
Room 223A
Juneau, Alaska 99802-9998907-790-4490
Fax: 907-790-4497

Email: regpagemaster@usace.army.mil

The **Kenai Peninsula Field Office** is responsible for projects located within the Aleutian Chain, the Bristol Bay Borough, the Kenai Peninsula Borough, the Kodiak Island Borough, and the Lake & Peninsula Borough. The Kenai Field Office has relocated, our new physical and mailing address is

Kenai Peninsula Field Office
44669 Sterling Highway, Suite B
Soldotna, Alaska 99669-7915
General: 907-753-2689 Fax: 907-420-0813
Email: CEPOA-RD-Kenai@usace.army.mil

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DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 35066
FORT WAINWRIGHT, AK 99703

October 11, 2022

Regulatory Division
POA-2022-00423

Jamie Burke
U.S. Air Force, Eielson Air Force Base
2310 Central Avenue, Suite 100
Eielson AFB, AK 99702

Dear Jamie Burke:

This is in response to your 6 September 2022, request for an approved jurisdictional determination for a 142.2-acre parcel of land. It has been assigned file number POA-2022-00423, Garrison Slough, which should be referred to in all correspondence with us. The project site is located within Section 11, T. 3 S., R. 3 E., Fairbanks Meridian; Latitude 64.668913º N., Longitude 147.090656 º W.; Fairbanks North Star Borough, Eielson Air Force Base, Alaska.

Based on our review of the information you furnished and available to us and our October 3, 2022, site visit, we have determined the above property contains waters of the U.S., including wetlands, under the U.S. Army Corps of Engineers' (Corps) regulatory jurisdiction. Specifically, there are: 0.7 acres of wetlands and 8.3 acres of waters. These waters of the U.S. are shown on the enclosed drawing prepared by the Corps and dated October 5, 2022. A copy of the Approved Jurisdictional Determination form is available under the above file number at the following address: https://www.poa.usace.army.mil/Missions/Regulatory/Jurisdictional-Determinations/Jurisdictional-Determination-Archive/.

This approved jurisdictional determination is valid for five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form (see section titled "Approved Jurisdictional Determination").

Department of the Army (DA) authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

You can find a copy of the DA permit application online at the following address: www.poa.usace.army.mil/Missions/Regulatory. Please see the sample drawings on our website: www.poa.usace.army.mil/Portals/34/docs/regulatory/guidetodrawings2012.pdf.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at Gwendolyn.A.Jacobson@usace.army.mil or by phone at (907)347-5802 if you have questions. For more information about the Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

Gwen Jacobson

Gwen Jacobson
Regulatory Specialist

Enclosures

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION
A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 09/30/2022

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Alaska District, POA-2022-00423

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: Alaska Borough: Fairbanks North Star Borough City: Eielson Air Force Base
Center coordinates of site (lat/long in degree decimal format): Lat. 64.668913 ° N., Long. 147.090656 °W.
Universal Transverse Mercator: 6N
Name of nearest waterbody: Garrison Slough
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Tanana River
Name of watershed or Hydrologic Unit Code (HUC): 1908030710 (HUC10) Moose Creek-Tanana River

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: September 30, 2022
☒ Field Determination. Date(s): October 3, 2022

SECTION II: SUMMARY OF FINDINGS
A. RHA SECTION 10 DETERMINATION OF JURISDICTION.
There are no *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. *[Required]*

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.
There are *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. *[Required]*

1. Waters of the U.S.
a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☒ Relatively permanent waters [2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months.

b. **Identify (estimate) size of waters of the U.S. in the review area:**
Non-wetland waters: 8.3 acres
Wetlands: 0.7

c. **Limits (boundaries) of jurisdiction based on:** 1987 Delineation Manual
Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]
☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:
Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

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[3] Supporting documentation is presented in Section III F.
[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Watershed size:
Drainage area:

Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.
☐ Tributary flows through CHOOSE: Enter or 10 or more tributaries before entering TNW.

Project waters are CHOOSE: Enter or 30 or more river miles from TNW.
Project waters are CHOOSE: Enter or 30 or more river miles from RPW.
Project waters are CHOOSE: Enter or 30 or more aerial (straight) miles from TNW.
Project waters are CHOOSE: Enter or 30 or more aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: Choose an item.

Primary tributary substrate composition (check all that apply):

☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: CHOOSE: Relatively Straight/Meandering
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: CHOOSE: Seasonal Flow/Intermittent but not Seasonal Flow/Ephemeral Flow
Estimate average number of flow events in review area/year: CHOOSE: Enter or 20 (or greater)
Describe flow regime:
Other information on duration and volume:
Surface flow is: CHOOSE: Discrete/Confined/Discrete and Confined/Overland Sheetflow Characteristics:
Subsurface flow: CHOOSE: Yes/No/Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	
☐ Discontinuous OHWM.[7] Explain:	

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width):

☐ Wetland fringe. Characteristics:

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Choose an item. Explain:

Surface flow is: CHOOSE: Discrete/Confined/Discrete and Confined/Overland Sheetflow

Characteristics:

Subsurface flow: CHOOSE: Yes/No/Unknown Explain findings:

☐ Dye (or other) test performed:

[6] A natural or man-made discontinuity in the OHWM does not necessarily server jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7] Ibid.

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☐ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain:

☐ Ecological connection. Explain:

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are CHOOSE: Enter or 30 or more river miles from TNW.

Project waters are CHOOSE: Enter or 30 or more aerial (straight) miles from TNW.

Flow is from: CHOOSE: Wetland to Navigable Water/Navigable Water to Wetland/Wetland to/from Navigable Water/No Flow

Estimate approximate location of wetland as within the CHOOSE: Enter or 500-year or greater. floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☐ Vegetation type/percent cover. Explain:

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: CHOOSE: Enter or 30 or more

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Y/N		Y/N	
Y/N		Y/N	
Y/N		Y/N	
Y/N		Y/N	

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:

☐ TNWs:

☐ Wetlands adjacent to TNWs:

2. RPWs that flow directly or indirectly into TNWs.

☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
The pond was excavated along Garrison Slough but still maintains an inlet and outlet and exhibits minor flow. Surface water is present year-round both in the pond and Garrison Slough. Garrison slough connects to the Tanana River via Piledriver Slough and Moose Creek, both of which exhibit perennial flow.

☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☒ Tributary waters: 8.3 acres

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

[8] See Footnote 3.

☐ Tributary waters:
☐ Other non-wetland waters: acres.
Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
☒ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☒ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: The 0.7 acres of wetlands lie in a drainage ditch that has an unbroken surface connection to the pond.

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.[9]
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters:
☐ Other non-wetland waters: acres.
Identify type(s) of waters:

[9] To complete the analysis refer to the key in Section III D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Jurisdiction Following Rapanos*.

☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

☐ Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams):

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams):

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐ Office concurs with data sheets/delineation report.

☒ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☐ U.S. Geological Survey Hydrologic Atlas:

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☐ Alaska District's Approved List of Navigable Waters

☐ U.S. Geological Survey map(s). Cite scale & quad name:

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: USDA Web Soil Survey

☒ National wetlands inventory map(s). Cite name: USFWS Wetlands Mapper

☐ State/Local wetland inventory map(s):

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): Digital Globe Maxar Satellite Imagery 2020-2022

or ☐ Other (Name & Date):

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:
The study area is located within the developed cantonment area of Eielson AFB. Much of the study area is highly developed and consists of upland fill. Based on consultant delineations and a field visit by the Corps, 9.0 acres of the study area were detemined to be Waters of the U.S. An 8.3 acre pond lies in the southeast corner of the study area. Originally formed by gravel mining, the excavated depression has a perennial inlet and outlet that connect to Garrison Slough (RPW), which is a tributary of Moose Creek (RPW), which eventually flows into the Tanana River (TNW).

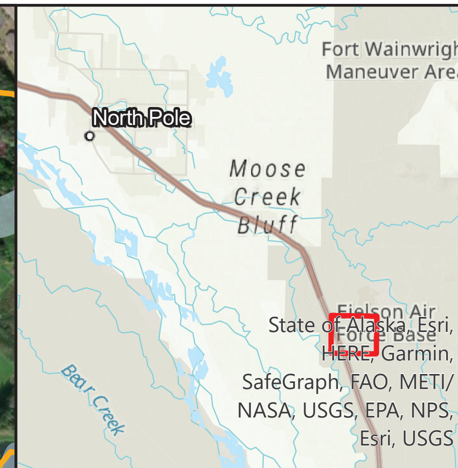
An additional 0.7 acres of wetland abuts the pond along its west side and continues towards the airfield. The surface water from the pond flows west through the wetlands within the drainage ditch, which transitions from semi-permanently flooded waters to seasonally flooded emergent wetland. Where a road crosses the wetland, culverts provide an unbroken surface connection.

Gwen Jacobson
____
Gwen Jacobson
Regulatory Specialist
NORTH Section

06 October 2022
____
Date

US Army Corps of Engineers®
Alaska District

POA-2022-00423



MAP FEATURES

- Review area
- Mapped Wetlands
- NWI Wetlands
- USDA Soil Survey

Lat: 64.668913
Long: -147.090656
Scale: 1:10,000

0 0.1 0.2 0.3
Miles

Last updated 10/4/2022

For planning purposes only

Map Sheet 1 of 1

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Jamie Burke, U.S. Air Force, Eielson Air Force Base		File Number: POA-2022-00423	Date: Oct 11, 2022
Attached is:			See Section below
	APPROVED JURISDICTIONAL DETERMINATION		D

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Gwen Jacobson, RS Alaska District Corps of Engineers Fairbanks Regulatory Field Office (CEPOA-RDN-C) Building 4511 8th Street Fort Wainwright, AK 99703 (907) 347-5802	Ms. Kate Bliss Regulatory Program Manager U.S. Army Corps of Engineers, Pacific Ocean Division CEPOD-PDC, Bldg 525 Fort Shafter, HI 96858-5440 (808) 835-4626 kate.m.bliss@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

______________________ Signature of appellant or agent.	Date:	Telephone number:

DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

November 18, 2022

Jamie Burke
NEPA Program Manager
354 CES/CEIE
2310 Central Avenue, Suite 100
Eielson AFB AK 99702

U.S. Army Corps of Engineers – Alaska District
Attn: Regulatory Branch, Ms. Ellen Lyons
P.O. Box 35066
Fort Wainwright AK 99703

SUBJECT: Case File POA-2022-00423, Garrison Slough, Wetlands Delineation Report Amendment

Dear Ms. Lyons:

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the basing action of four additional KC-135 aircraft at Eielson Air Force Base, Alaska (the Proposed Action). Pursuant to Section 404 of the Clean Water Act (CWA), 33 U.S.C. §§ 1251-1387), to determine the baseline (current existing conditions) extent of wetlands and waters within the KC-135 Redistribution Project study area, a wetlands delineation was conducted in September 2021 and the report was provided to the U.S. Army Corps of Engineers (USACE) in a letter dated August 31, 2022. Since that time, USAF has amended the report to include delineation of two additional areas for construction projects associated with the Proposed Action. Results from the field data collection were mapped in accordance with the USACE Wetland Delineation Manual (USACE 1987[1]) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (2007 Supplement; USACE 2007[2]). The amended wetlands delineation report is presented in Attachment 1, *Final Preliminary Jurisdictional Determination Report including Technical Amendment, Eielson Air Force Base KC-135 Redistribution Project*. The newly delineated areas are referred to as “Area 1” and “Area 2” in the amended report.

The results of the amended field-verified mapping show waters account for 7.69 acres (3.9 percent) of the study area (found within Area 3), and wetlands account for 0.41 acres (0.2 percent) of the study area (found within Area 1). All waters were classified in the Cowardin

---

[1] USACE. Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Waterways Experiment Station, Vicksburg MS.
[2] USACE. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region, (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-07-24. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September

system (Cowardin et al. 1979[3]) as Freshwater Pond, and one wetland found in the study area was classified as Emergent Wetland. For these reasons, we conclude that implementation of the Proposed Action *would impact* 0.41 acres of wetlands and would require an Individual Section 404 permit, and the No Action Alternative *would have no effect* on wetlands. The USAF respectfully requests your review of the amended report and concurrence with this determination in compliance with Section 404 of the CWA. When complete, copies of the draft EA will be forwarded for your review.

If you have any questions or concerns, please contact Ronald Gunderson, Natural/Cultural Resources Manager, 354 CES/CEIEA, at ronald.gunderson@us.af.mil or (907) 377-5182. Please provide written comments, concurrence, or other information regarding the action, within 30 days from receipt of this letter, if possible. Thank you in advance for your assistance in this effort.

Sincerely,

BURKE.JAMIE.LYN.1604772067 Digitally signed by BURKE.JAMIE.LYN.1604772067 Date: 2022.11.23 15:30:10 -09'00'

JAMIE BURKE, GS-11, DAF

1 Attachment:
1. Final Preliminary Jurisdictional Determination Report including Technical Amendment, Eielson Air Force Base KC-135 Redistribution Project, September 9, 2022

cc:
PACAF/A4/A6/A7

[3] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Attachment 1. Final Preliminary Jurisdictional Determination Report including Technical Amendment, Eielson Air Force Base KC-135 Redistribution Project, September 9, 2022

Preliminary Jurisdictional Determination Report including Technical Amendment

Eielson Air Force Base KC-135 Redistribution Project

September 9, 2022

Prepared for:

Brice Engineering
3700 Centerpoint West, Suite 8223
Anchorage, AK 99503

Prepared by:

Stantec Consulting Services, Inc.
725 East Fireweed Lane Suite 200
Anchorage, Alaska 99503

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Executive Summary

This 2022 Preliminary Jurisdictional Determination Report presents the findings of the baseline (current existing conditions) extent of wetlands and waters within the KC-135 Redistribution Project study area for Brice Engineering.

The 2022 study area wetland mapping is based on the criteria in the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (USACE 2007), and the 2020 National Wetland Plant List (USACE 2020).

The results of the field verified mapping shows wetlands account for 0.41 acres of the study area (0.2 percent), and waters account for 7.69 acres (3.9 percent) of the study area.

Project Study Area: Waters of the U.S. Determination

Status	Acres	Percent of Study Area
Wetlands	0.41	0.2
Waters	7.69	3.9
Upland (Non-wetlands)	190.52	95.9
Total Study Area	**198.62**	**100.0**

One wetland was found in the study area, classified in the Cowardin system (Cowardin et al. 1979) as Emergent Wetland, and one pond was found in the study area, classified in the Cowardin system as Freshwater Pond.

Abbreviations

2007 Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)
APT	Antecedent Precipitation Tool
FVP	Field Verification Point
GPS	Global Positioning System
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
Stantec	Stantec Consulting Services Inc.
study area	KC-135 Redistribution Project study area
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WB	Waterbody Point
WD	Wetland Determination Point
WOUS	Waters of the U.S.

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has determined the baseline status of the 198.62-acre KC-135 Redistribution Project study area (study area) for Brice Engineering. Stantec conducted field work to determine the extent of wetlands and waters. The study area is located within Eielson Air Force Base, Alaska.

This Preliminary Jurisdictional Determination Report provides the baseline data necessary to determine the total Waters of the U.S. (WOUS) within the study area.

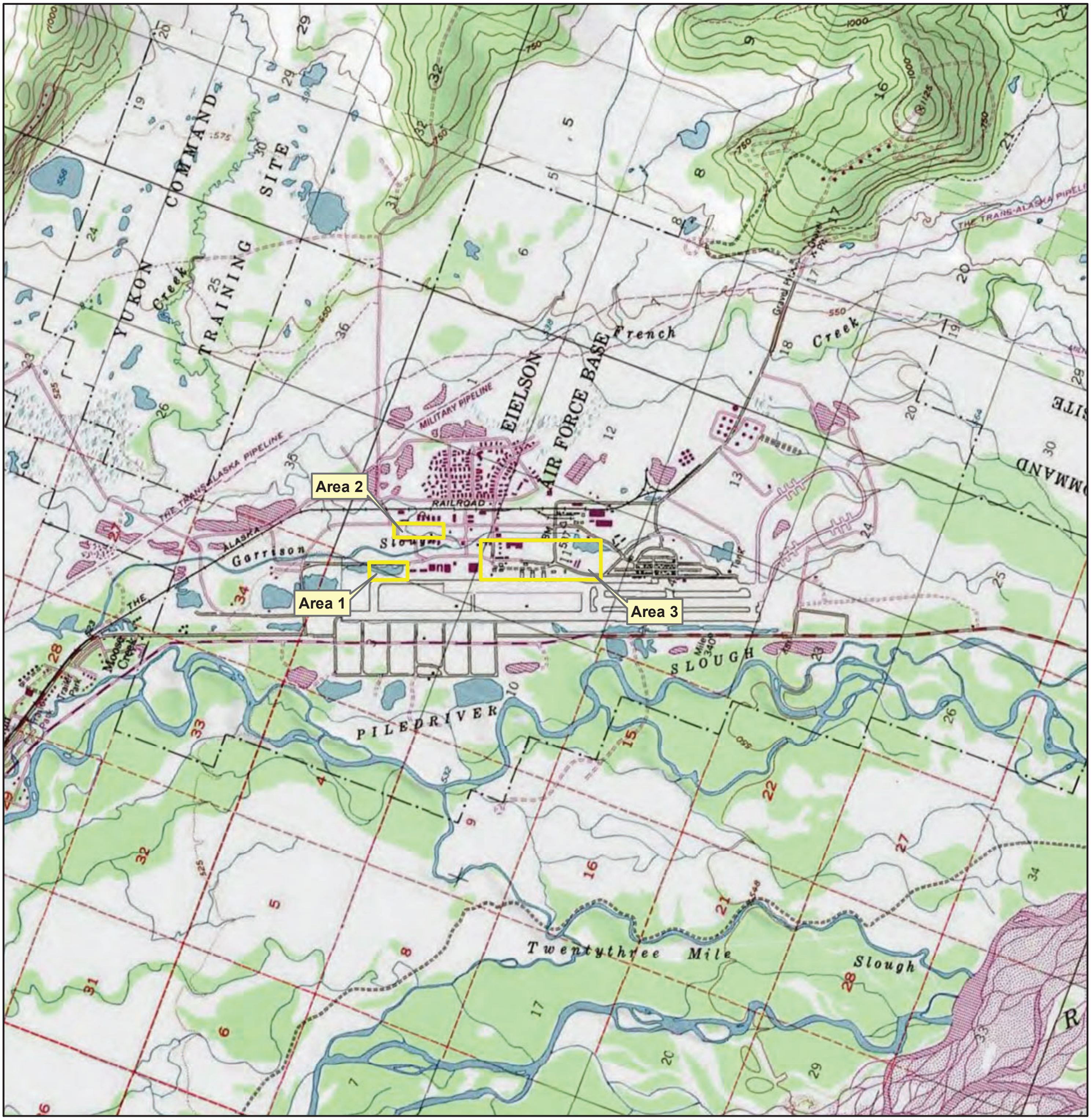
The field team collected field data including wetland determinations in September 2021 and August 2022. The results were mapped in accordance with the U.S. Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (2007 Supplement; USACE 2007). This Report also meets the guidelines set forth in Special Public Notice 2020-00399 (USACE 2020), Consultant Supplied Jurisdictional Determination Reports.

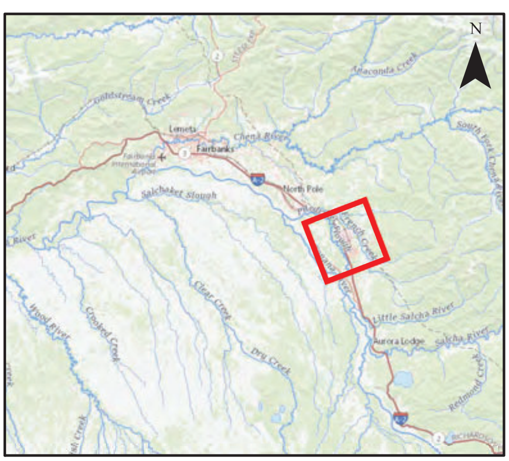
1.1 STUDY AREA LOCATION

The study area is located within the urban environments of Eielson Air Force Base, Alaska. The study area is made up of three components (Figure 1) in the Fairbanks C-1 NE United States Geological Survey (USGS) quadrangle, in the Fairbanks Meridian, and is in 3 Public Land Survey System sections: Township 3S, 3E, Sections 2, 3, and 11 (Table 1).

Table 1 Study Area Location

Area	Meridian	Township	Range	Sections	Centroid Latitude (DD)	Centroid Longitude (DD)	Acres
1	Fairbanks	3S	3E	2,3	64.6837	-147.1066	21.63
2	Fairbanks			2	64.6823	-147.0949	22.63
3	Fairbanks			11	64.6695	-147.0911	154.36





Study Area

0 0.5 1 Miles

(At original document size of 8.5x11)
1:63,360 1 in = 1 miles

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Project Location

Figure Number

1

Stantec

2.0 EXISTING DATA AND METHODOLOGY

2.1 EXISTING DATA

Sources of existing data used in developing baseline environmental data include: U.S. Department of Agriculture (USDA) ecoregion and soil survey information, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory wetland mapping, USGS project watersheds and stream data, and local climate data.

2.1.1 National Wetlands Inventory

The National Wetlands Inventory (NWI) on-line Wetlands Mapper (USFWS 2022a) shows the study area is covered by digital NWI data. Fairbanks area NWI mapping was most recently updated using 1997 Color Infrared aerial photography. Mapping was conducted at a scale of 1:30,000.

The NWI shows a Freshwater Pond in Area 1 of the study area. A Freshwater Pond is shown in the northeast corner of Area 3, with two Riverine (stream) components. A Freshwater Emergent Wetland is shown in the southern portion of Area 3 (Figure 2).

2.1.2 National Hydrography Dataset

The study area is within the Moose Creek – Tanana River USGS Hydrologic Unit Code 10 watershed (1908030710) (USGS 2022).

One National Hydrography Dataset-mapped stream flows through the study area in the same location as the NWI-mapped Riverine waters (USGS 2022).

2.1.3 Soil Surveys

The Soil Survey of Fort Wainwright Area, Alaska (USDA 2006) covers the study area.

The study area falls within three map units (Table 2 and Figure 3). The table lists the potential hydric components for each of the map units.

Table 2 Soil Survey Units within the Study Area

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area	Percent Hydric Components
363	Jarvis-Salchaket complex	28.81	14.5	7
UC	Urban land-Typic Cryorthents complex, 0 to 2 percent slopes	163.05	82.1	0
W	Water	6.75	3.4	N/A
	Total	**198.62**	**100.0**	

Study Area

NHD Flowline

NWI Type

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Riverine

0 600 1,200 Feet

(At original document size of 8.5x11)

1:11,000 1 in = 916.67 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

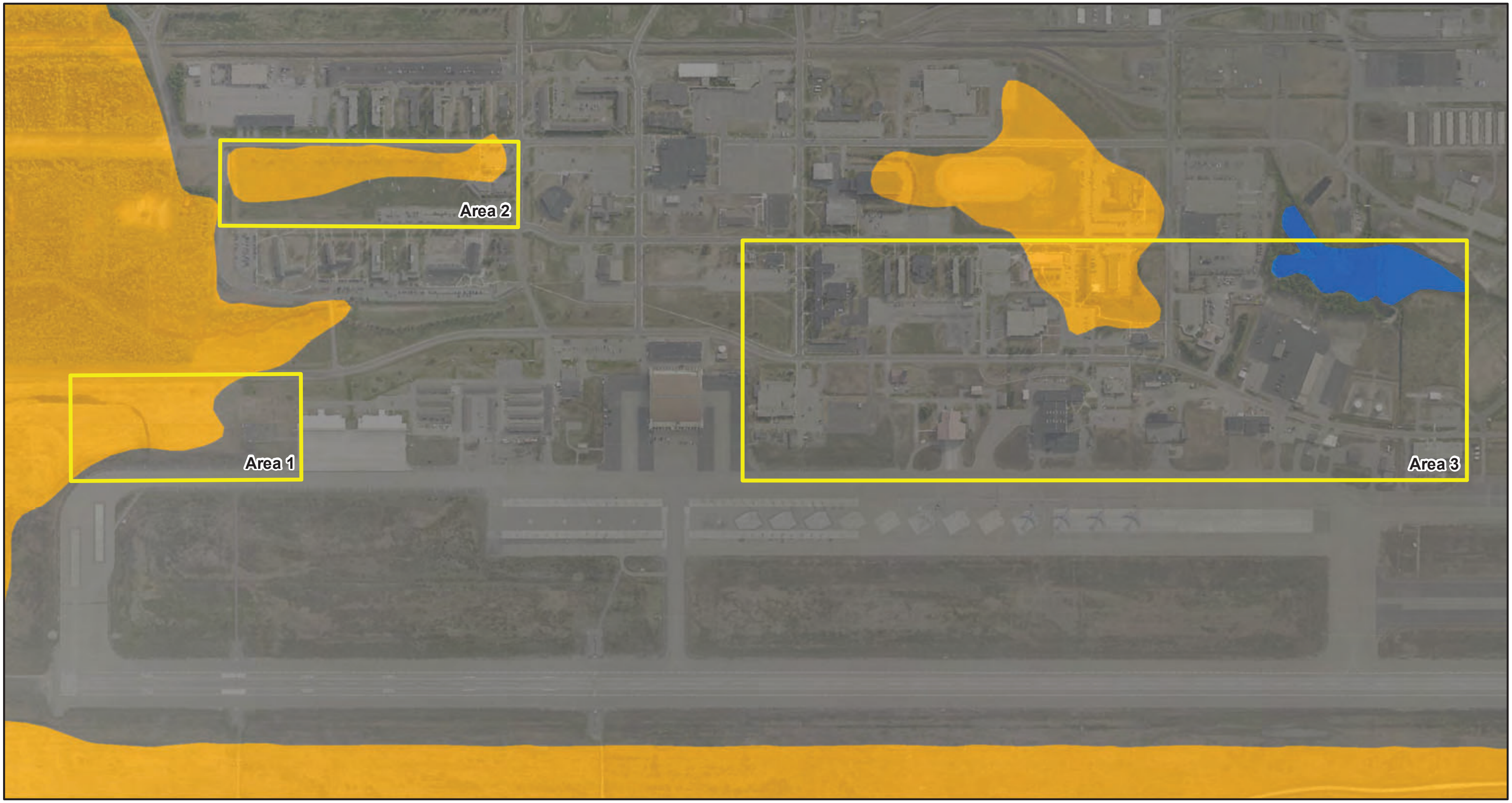
Figure

NWI and NHD Mapping

Figure Number

2

Stantec



Study Area

Soil Map Unit

Jarvis-Salchaket complex

Urban land-Typic Cryorthents complex, 0 to 2 percent slopes

Water

0 600 1,200 Feet

(At original document size of 8.5x11)
1:11,000 1 in = 916.67 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Soil Mapping

Figure Number

3

Stantec

2.1.4 Climate Data

The growing season for this area begins on May 3 and ends on October 3 (USACE 2007).

Precipitation data leading to 2021 field work is listed in Table 3. The weather conditions preceding the field investigations were considered during onsite determinations. Normal precipitation is based on 1981-2010 records for North Pole, Alaska (National Oceanic and Atmospheric Administration 2022). Field work was conducted September 22, 2021. Precipitation for the water year, starting October 2020, was 62 percent of normal (Table 3). These data suggest that conditions during field work were normal to drier than normal.

Table 3 2021 Water Year WETS Precipitation for North Pole, Alaska

Month	Total Monthly Accumulated Precipitation (Inches)	Average Monthly Accumulated Precipitation 1981-2010 (Inches)	Percent of Average Precipitation	30% Chance Precipitation	
				Less Than (In.)	More Than (In.)
October 2020	0.48	0.93	52	0.56	1.12
November 2020	1.05	0.73	144	0.28	0.86
December 2020	0.15	0.70	21	0.27	0.84
January 2021	0.00	0.62	0	0.26	0.74
February 2021	0.97	0.48	202	0.14	0.55
March 2021	0.22	0.30	73	0.08	0.34
April 2021	1.13	0.37	305	0.00	0.28
May 2021	0.59	0.65	91	0.24	0.79
June 2021	1.34	1.57	85	0.97	1.90
July 2021	1.69	1.97	86	1.05	2.41
August 2021	3.74	2.01	186	1.26	2.42
September 2021	0.30	1.10	27	0.65	1.34
Total	**7.07**	**11.42**	**62**	**-**	**-**

Precipitation data leading to 2022 field work is listed in Table 4. The weather conditions preceding the field investigations were considered during onsite determinations. Normal precipitation is based on 1981-2010 records for North Pole, Alaska (National Oceanic and Atmospheric Administration 2022). Field work was conducted August 5, 2022. Precipitation for the water year, starting October 2021, was 156 percent of normal (Table 4). These data suggest that conditions during field work were normal.

Table 4 2022 Water Year WETS Precipitation for North Pole, Alaska

Month	Total Monthly Accumulated Precipitation (Inches)	Average Monthly Accumulated Precipitation 1981-2010 (Inches)	Percent of Average Precipitation	30% Chance Precipitation	
				Less Than (In.)	More Than (In.)
October 2021	1.99	0.93	214	0.56	1.12
November 2021	0.41	0.73	56	0.28	0.86
December 2021	5.22	0.70	746	0.27	0.84
January 2022	0.15	0.62	24	0.26	0.74
February 2022	1.12	0.48	233	0.14	0.55
March 2022	0.10	0.30	33	0.08	0.34
April 2022	MT	0.37	0	0.00	0.28
May 2022	0.93	0.65	143	0.24	0.79
June 2022	1.63	1.57	104	0.97	1.90
July 2022	M1.41	1.97	72	1.05	2.41
Total	**12.96**	**8.32**	**156**	-	-

The Antecedent Precipitation Tool (APT, EPA 2022) was also run for the study area and returned a value of Normal Conditions for September 22, 2021, and a value of Normal Conditions for August 5, 2022. The APT output is shown in Appendix A.

2.1.5 Threatened and Endangered Species

There are no threatened or endangered State or Federally listed species within the general area around the study area (USFWS 2022b).

2.2 METHODOLOGY

This section provides the methodology used during field data collection and digital mapping.

2.2.1 Field Data Collection

During the 2021 and 2022 wetland field evaluations, Global Positioning System (GPS) locations and detailed information on plots (1/10) were recorded in representative project vegetation types. Additional field data, notes, and photographs were used to evaluate mapping areas with similar characteristics.

Field data was collected and recorded using three types of plots:

Wetland Determination (WD) Plots. At these sites, investigators recorded detailed descriptions of vegetation, hydrology, and soils on field data forms. Wetland status for this plot type was determined based on the presence or absence of hydrophytic vegetation, hydrology, and hydric soils (USACE 2007).

Field Verification Points (FVP). Photographs and GPS locations were taken for vegetation communities and landscape positions that were clearly wetland, water, or upland. If a wetland or water, Hydrogeomorphic (HGM) and Cowardin classifications were recorded.

Stream Crossing (SC) Points. Photographs and GPS locations were taken when streams were encountered. Cowardin classifications were recorded.

Waterbody (WB) Points. Photographs and GPS locations were taken when ponds and lakes were encountered. Cowardin classifications were recorded.

Plant Data

Alaska is divided into subregions, where plant indicator statuses may differ from the rest of the State. The study area is within the National Wetland Plant List subregion Interior Alaska Lowlands. None of the six plants with indicator status changes were found on site. Plant indicator statuses are described in Appendix B. Plants were identified to the taxonomic level of species.

The presence of hydrophytic vegetation was determined using the prevalence index and the dominance test (USACE 2007).

Hydric Soils Assessment

Field indicators of hydric soils and determination of hydric soil status was based on USDA National Resource Conservation Service (NRCS) guidance (USDA 2018) and the 2007 Supplement (USACE 2007). The 2007 Supplement contains a subset of hydric soil indicators found in the U.S. as determined by the National Technical Committee for Hydric Soils (USACE 2007). Additional soil characteristics recorded within the soil horizons were based on NRCS guidance (Schoeneberger et al. 2012).

Hydrology

The 2007 Supplement lists numerous primary and secondary hydrology indicators. All indicators found in each sampling area were recorded in the data form.

Field Data

Field data were collected at 20 sites throughout the study area. All field data were entered into a project database where the data were reviewed; queries were generated from the database to provide the information needed for mapping and results analyses.

Field data was collected September 22, 2021, and August 4, 2022, by Professional Wetland Scientist Steve Reidsma. Twelve plots were collected in 2021, and eight in 2022. Field plot types collected are shown in Table 5. Each field plot with photos is presented in Appendix C.

Table 5 Field Data Contributing to this Project

Field Plot Type	Wetlands and Waters	Uplands	Total Plots
Wetland Determination (WD)	0	1	1
Field Verification Point (FVP)	2	14	16
Stream Crossing (SC)	1	0	1
Waterbody (WB)	2	0	2
Total	**5**	**15**	**20**

2.2.2 Wetland Mapping

Final mapping (waters boundaries, Cowardin classification) was completed using 2-foot contour data and several years of aerial imagery collected by the Fairbanks North Star Borough (2012, 2017, and 2020) in ESRI's ArcMap GIS (10.8) environment.

Field data were used to identify the characteristics of wetlands or waters at a specific location. In addition to imagery interpretations, ancillary data including field notes, general landscape position, slope, and aspect were utilized in the mapping process.

Mapping polygons were drawn to delineate differences among the classification systems used to attribute wetlands and waters polygons. Delineation occurred at a scale of 1:600 (one-inch equals 50 feet).

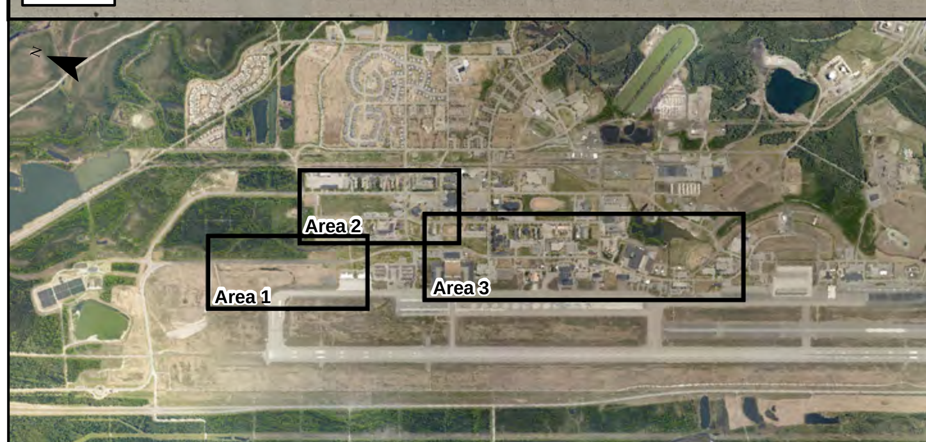
3.0 RESULTS

3.1 WETLANDS AND WATERS

The field verified wetlands and waters totals are summarized in Table 6. Figure 4 shows the wetlands and waters in the study area.

Table 6 Waters Within the Study Area

Status	Acres	Percent of Study Area
Wetlands	0.41	0.2
Waters	7.69	3.9
Uplands	190.52	95.9
Total Study Area	**198.62**	**100.0**



Field Plot Type

- Wetland
- Pond
- Stream
- Upland

- Study Area
- Existing Structure (Labeled by Building ID)
- Waterbody
- Wetland

Coordinate System: WGS 1984 UTM Zone 6N
Projection: Transverse Mercator
Datum: WGS 1984
Imagery: Fairbanks North Star Borough 2017

0 200 400 800 Feet

1:4,800 1 inch equals 400 feet

Eielson Air Force Base
KC-135 Redistribution

Waters of the U.S. Delineation

Figure 4	8/24/22

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A freshwater pond connected to Garrison Slough was delineated in the study area. A full wetland delineation (ST09) showed that the vegetated areas adjacent to the pond do not qualify as wetlands. The pond is an excavated feature with an abrupt upland and waters edge and was classified under the NWI system as PUBHx. The total acreage of the pond within the study area is 7.69 acres. A linear feature connected to the pond extends to the southwest towards the tarmac. A photograph of the pond is shown in Figure 5.

Figure 5 Pond

Depressions in the southeastern portion of the study area near the aircraft parking aprons were reviewed, including the area identified by the NWI as an excavated freshwater emergent wetland. These depressions were found to be water runoff collection basins and snow dumps. There was no evidence of dominant hydrophytic vegetation or wetland hydrology in these depressions (e.g., sediment deposits, water marks), and they appeared to be terminal and had no direct surface connection to WOUS nor each other. Current Environmental Protection Agency guidance was reviewed to determine if these features meet the pre-2015 regulatory definition of WOUS. The depressions are manmade features that do not qualify as WOUS under 40 CFR 230.3(s)(1-7). Photos from several of these features are shown in Figure 6.

Figure 6 Depression Features

A drainage ditch was reviewed in the southwest corner of the study area in an areas identified by the NWI as a freshwater emergent wetland. The ditch is an excavated linear feature that contains surface water and is dominated by Obligate wetland vegetation, which qualifies it as a wetland. A photograph of the feature is shown in Figure 7.

Figure 7 Wetland Ditch

3.1.1 Cowardin Classification

As part of the wetlands mapping, vegetation communities were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

Table 7 shows all waters in the study area are classified in the Cowardin system as Freshwater Pond, covering 7.69 acres of the study area, and all wetlands in the study area are classified as Emergent, covering 0.41 acres of the study area.

Table 7 Cowardin Classifications for the Study Area

Cowardin Type	NWI Code	Waters Acres	Percent of Study Area	Percent of Wetlands and Waters
Wetlands				
Emergent Wetland	PEM1	0.41	0.2	5.1
	Total Wetlands	**0.41**	**0.2**	**5.1**
Waters				
Freshwater Pond	PUB	7.69	3.9	94.9
	Total Waters	**7.69**	**3.9**	**94.9**
	Total Wetlands and Waters	**8.10**	**4.1**	**100.0**
	Total Uplands	190.52	95.9	
	Total Study Area	**198.62**	**100.0**	

3.1.2 Tributaries

The delineated pond is an excavation of Garrison Slough and has perennial inlet and outlet to the slough. The wetland occurs in a concave drainage feature that has connection to Garrison Slough, confirmed by field data points ST19 and ST20. Garrison Slough is a tributary to Moose Creek, which flows into Piledriver Slough, which flows into the Tanana River, a Traditional Navigable Water.

3.2 VEGETATION

The study area is part of the urban environment of Eielson Air Force Base and has been historically cleared, filled, and built. Non-paved areas are primarily characterized by mowed vegetation, landscaped trees or shrubs, or in some cases disturbance regrowth. The pond in the northeast was created by gravel mining; forested areas around the edge are disturbance regrowth. The wetland in the southeast occurs in an excavated linear depression; its dominant vegetation species is a sedge, *Carex aquatilis* (Leafy Tussock Sedge).

Plant Species

Eleven vascular plant species are included in the project plant list (Appendix B) and represent the species recorded at the WD plot (ST09), which was in a regrowth forest dominated by Balsam Poplar, and the Leafy Tussock Sedge observed at ST18.

None of the species recorded in the study area are considered threatened or endangered (USFWS 2022b). Only one plant species is endangered in Alaska, *Polystichum aleuticum*, a small fern endemic to the Aleutian Islands, and is not expected to occur in the study area.

4.0 REFERENCES

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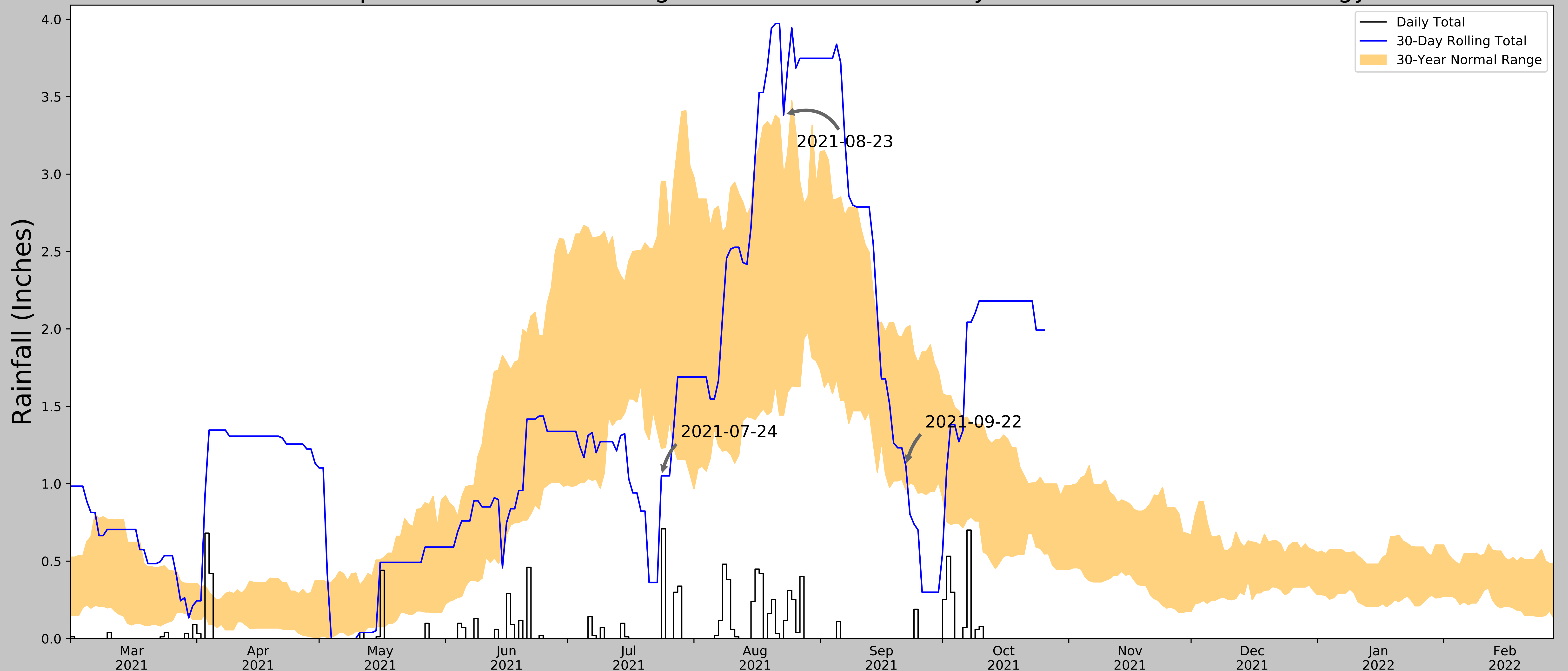
APPENDICES

Appendix A ANTECEDENT PRECIPITATION TOOL

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



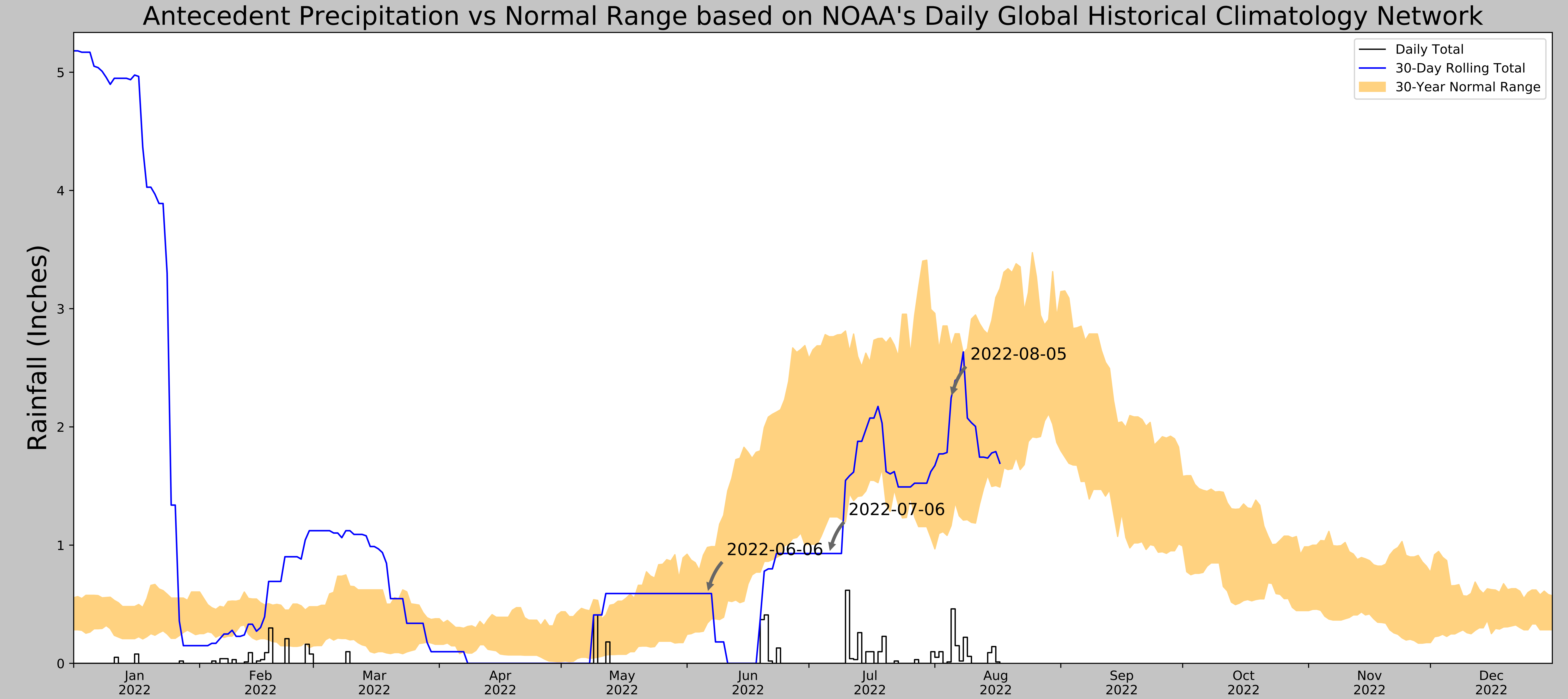
Coordinates	64.67, -147.09
Observation Date	2021-09-22
Elevation (ft)	540.73
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-22	0.962992	2.005118	1.114173	Normal	2	3	6
2021-08-23	1.444095	2.981496	3.38189	Wet	3	2	6
2021-07-24	1.229921	2.953543	1.051181	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
N POLE	64.7581, -147.3253	475.066	9.234	65.664	4.762	11156	89
N POLE 1N	64.76, -147.34	496.063	0.453	20.997	0.213	78	1
MOOSE CREEK	64.7136, -147.1581	517.06	5.811	41.994	2.859	1	0
EIELSON FLD	64.6667, -147.1	546.916	9.17	71.85	4.785	68	0
AURORA	64.8553, -147.7217	442.913	13.455	32.153	6.487	43	0
Fairbanks F.O.	64.85, -147.8	450.131	15.339	24.935	7.285	7	0



Coordinates	64.67, -147.09
Observation Date	2022-08-05
Elevation (ft)	540.73
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-08-05	1.164173	2.680315	2.244095	Normal	2	3	6
2022-07-06	1.238583	2.762992	0.929134	Dry	1	2	2
2022-06-06	0.340945	0.980709	0.590551	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
N POLE	64.7581, -147.3253	475.066	9.234	65.664	4.762	11152	90
N POLE 1N	64.76, -147.34	496.063	0.453	20.997	0.213	83	0
MOOSE CREEK	64.7136, -147.1581	517.06	5.811	41.994	2.859	1	0
EIELSON FLD	64.6667, -147.1	546.916	9.17	71.85	4.785	67	0
AURORA	64.8553, -147.7217	442.913	13.455	32.153	6.487	43	0
Fairbanks F.O.	64.85, -147.8	450.131	15.339	24.935	7.285	7	0

Appendix B PLANT LIST

Project study area plants recorded during Stantec field work in 2021.

Latin Name	Common Name[a]	Indicator Status Rating[a]
Tree		
Populus balsamifera	Balsam Poplar	FACU
Shrub/Sapling		
Arctostaphylos uva-ursi	Red Bearberry	UPL
Populus balsamifera	Balsam Poplar	FACU
Populus tremuloides	Quaking Aspen	FACU
Rosa acicularis	Prickly Rose	FACU
Salix bebbiana	Gray Willow	FAC
Shepherdia canadensis	Russet Buffalo-Berry	FACU
Herbaceous		
Calamagrostis canadensis	Bluejoint	FAC
Carex aquatilis	Leafy Tussock Sedge	OBL
Chamaenerion angustifolium	Narrow-Leaf Fireweed	FACU
Equisetum arvense	Field Horsetail	FAC
Orthilia secunda	Sidebells	FACU

Appendix C FIELD DATA FORMS AND PHOTOS

PHOTO REPORT

Plot Number	ST01
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.672739
Longitude (DD)	-147.097385

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST02
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671872
Longitude (DD)	-147.094117

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST03
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.669064
Longitude (DD)	-147.094253

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST04
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.668577
Longitude (DD)	-147.093675

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST05
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.670454
Longitude (DD)	-147.096018

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST06
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671704
Longitude (DD)	-147.097127

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST07
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671145
Longitude (DD)	-147.09615

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: NE

PHOTO REPORT

Plot Number	ST08
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671139
Longitude (DD)	-147.095059

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Alaska Region

Plot No: ST 09

Project:	Date: 9/22/21
Applicant: Brice	Investigators: SRC
Borough/City/Location: FAFB	

NAD 83, Decimal Degrees

STANTEC

Latitude: 64.66716	Watershed: HUC12 Garrison Slough-Moose Creek
Longitude: -147.085820	Location Notes:
Elevation (ft): 533	mounds of gravel nearby

SUMMARY OF FINDINGS

Are "Normal Circumstances" Present?			YES	Hydrophytic Vegetation Present?	NO
Significantly Disturbed?	VEG	SOILS	HYDRO	Hydric Soils Present?	NO
Naturally Problematic?	VEG	SOILS	HYDRO	Wetland Hydrology Present?	NO
Remarks:				**Is the Sampled Area within a Wetland?**	NO

VEGETATION T< 1%, P = Present **SUBREGION:**

Tree Stratum DBH ≥ 3 inch — 1/10 acre circular plot unless noted, absolute cover recorded

Species	IND	DOM	Cover	Species	IND	DOM	Cover
1. POPBAL	FU	Y	25	3.			
2.				4.			

Total Tree Cover: 25 — 50% of Total Cover: 12.5 — 20% of Total Cover: 5

Sapling/Shrub Stratum	IND	DOM	Cover		IND	DOM	Cover
1. POPBAL	FU	Y	35	8.			
2. ROSACI	FU	Y	20	9.			
3. POPTRE	FU	N	15	10.			
4. ~~VACUIT~~				11.			
5. ARCUVAURS(	UP	N	5	12.			
6. SALBEB	F	N	3	13.			
7. SHECAN	FU	N	T	14.			
				15.			

Total Shrub Cover: 78 — 50% of Total Cover: 39 — 20% of Total Cover: 15.6

Herbaceous Stratum	IND	DOM	Cover		IND	DOM	Cover
1. CHAANG	FU	Y	3	13.			
2. EQUARV	F	N	T	14.			
3. CALCAN	F	Y	5	15.			
4. ORTSEC	FU	N	T	16.			
5.				17.			
6.				18.			
7.				19.			
8.				20.			
9.				21.			
10.				22.			
11.				23.			
12.				24.			
				25.			

Total Herb Cover: 8 — 50% of Total Cover: 4 — 20% of Total Cover: 1.6

1.Open Water — 2. Bare ground

Remarks: Bryophytes and Lichens may be listed in the Herbaceous columns

Soil: S
NE

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:
OBL species	-	x 1 =
FACW species	-	x 2 =
FAC species	8	x 3 = 24
FACU species	98	x 4 = 392
UPL species	5	x 5 = 25
Column Totals:	111 (A)	441 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

N Dominance Test is >50%

N Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1]

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Project Vegetation Type

CDF

Cowardin Code: U

HGM Classification: n/a

Landform: lowland-bench

Local Relief: flat

Microtopography: flat — Slope: — — Aspect: 180

SOIL

Plot No: ST 09

Profile Description: Describe to the depth needed to document the presence/absence of soil indicators										Soil Map Unit Name
	Horizon	Soil Matrix		Redox Features						-
Depth (in.)	Name	Color (moist)	%	Type[1]	Color	%	Loc[2]	Mod[3]	Texture	Horizon Comments
1-0	Oi									
8-18	Bw	10YR2½/4	100					GR	SA	

[1]Type: C=Concentrations, D=Depletions, OX=Oxidized Roots, RM = Reduced Matrix [2]Location: PL=Pore Linings, RC=Root Channels, M=Matrix, CS=Coated Sand Grains

Remarks: previously dist., prior gravel pit area

[3]Texture Modifiers: Mucky (MK), Peaty (PT), Permafrost (PF) | Coarse Fragments: Gravelly (GR), Cobbly (CB), Stony (ST) (15-35%), 35-60% = Very (V), 60-90% = Extremely (X)

Hydric Soil Indicators Measure from the top of the mineral soil layer except for A1, A2, A3, A4

- N Histosol or Histel (A1)
- N Histic Epipedon (A2)[4]
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Thick Dark Surfaces (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Hydric Soils Present?	NO
NRCS Drainage Class:	MWD
Depth of Organic Soils:	1
Restrictive Layer Type:	—
Restrictive Layer Depth:	—

Indicators for Problematic Hydric Soils[5] (See Page 91/Section 4 for Problematic Hydric Soils Details)

- N Depleted Below Dark Surface (A11)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depression (F8)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Alaska Color Change (TA4) Give details of color change
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed w/o Hue 5Y or Redder Underlying
- N AA Positive (mineral soil, 60% of horizon 4 inches thick)
- N Ponded/Flooded/High Water Table (12 inches or higher)
- N Low Organic Matter/Low Iron/High pH Soil/New Wetland
- ___ Other (explain in remarks)

[4]Underlain by mineral soil w/chroma of ≤2

[5]Must have Hydrophytic Vegetation and Primary Hydrology, and an appropriate landscape position unless disturbed or problematic

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- N Dry-Season Water Table (C2)**
- N Other (Explain in Remarks)

Are Climatic/Hydrologic Conditions on Site Typical for this time of Year? yes

Secondary Indicators (2 or more required)

- N Water-stained Leaves (B9)
- N Drainage Patterns (B10)
- N Oxidized Rhizospheres along Living Roots (C3)(w/in 12")
- N Presence of Reduced Iron (C4)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", note as restrictive layer)
- N Microtopographic Relief (D4)
- N FAC-Neutral Test (D5)

Field Observations (inches from ground surface)

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Episaturation ____ Endosaturation ____

Water Source:

Wetland Hydrology Present? NO

Dry Season Water Table SC, Interior, Western AK:

Mid May – late July
**Mineral Soils 12-24 inches
**Organic Soils 12-40 inches

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FAC-Neutral Test = #OBL+FW dominants > #FU + UPL dominants; add non-dominants if tie

PHOTO REPORT

Plot Number	ST09
Wetland Status	Upland
Plot Type	WD
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.667159
Longitude (DD)	-147.085801

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST10
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021
NWI Classification	PUBHx
Latitude (DD)	64.667137
Longitude (DD)	-147.085484

Photo Type: Hydrology Direction: E

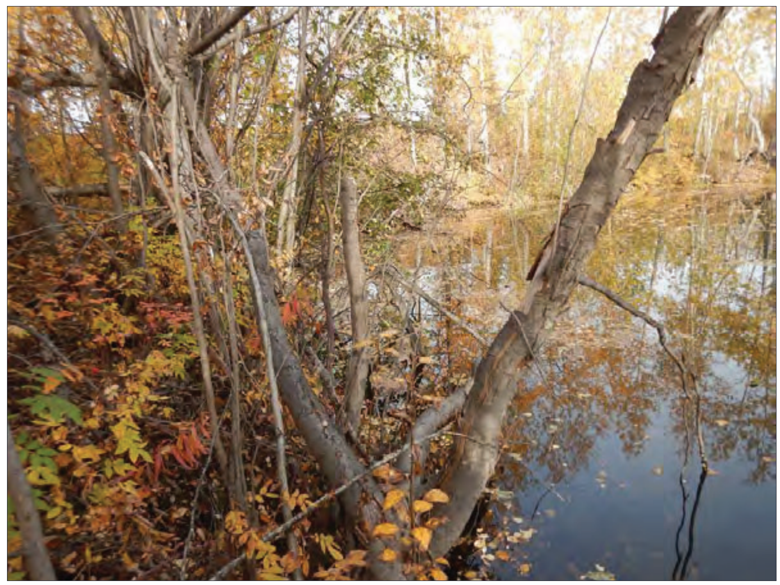


Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST11
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021
NWI Classification	PUBHx
Latitude (DD)	64.665478
Longitude (DD)	-147.085506

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: SE

PHOTO REPORT

Plot Number	ST12
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.665507
Longitude (DD)	-147.085636

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST13
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/10/2022
NWI Classification	U
Latitude (DD)	64.673489
Longitude (DD)	-147.09808

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST14
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/11/2022
NWI Classification	U
Latitude (DD)	64.681269
Longitude (DD)	-147.094018

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST15
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/12/2022
NWI Classification	U
Latitude (DD)	64.682475
Longitude (DD)	-147.09637

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST16
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/13/2022
NWI Classification	U
Latitude (DD)	64.682401
Longitude (DD)	-147.104931

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST17
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/14/2022
NWI Classification	U
Latitude (DD)	64.683514
Longitude (DD)	-147.106019

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST18
Wetland Status	Wetland
Plot Type	FVP
Plot Date	8/15/2022
NWI Classification	PEM1Cx
Latitude (DD)	64.684428
Longitude (DD)	-147.10702

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST19
Wetland Status	Wetland
Plot Type	FVP
Plot Date	8/16/2022
NWI Classification	PEM1Cx
Latitude (DD)	64.68862
Longitude (DD)	-147.10947

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST20
Wetland Status	Stream
Plot Type	FVP
Plot Date	8/17/2022
NWI Classification	R2UBH
Latitude (DD)	64.688915
Longitude (DD)	-147.108297

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NA

Photo Type: Hydrology Direction: SE

U.S. FISH AND WILDLIFE SERVICE CONSULTATION

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DEPARTMENT OF THE AIR FORCE
354TH FIGHTER WING (PACAF)
EIELSON AIR FORCE BASE, AK

August 31, 2022

Jamie Burke
NEPA Program Manager
354 CES/CEIE
2310 Central Avenue, Suite 100
Eielson AFB AK 99702

Charleen Buncic
Wildlife Biologist
U.S. Fish and Wildlife Service
Northern Alaska Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks AK 99701

Dear Ms. Buncic,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the redistribution of KC-135 Stratotanker aircraft to Eielson Air Force Base (AFB), Alaska. Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the USAF has determined that the redistribution of KC-135 Stratotanker aircraft to Eielson AFB *will have no effect on* federally listed species.

Proposed Action

Eielson AFB is located 23 miles (37 kilometers) southeast of Fairbanks, Alaska (Attachment 1) and has been an active military base since 1944. It is the home of the 354th Fighter Wing (354 FW), serving as the hosting unit with F-16 C/D Fighting Falcon aircraft. The USAF is preparing an Environmental Assessment for the Proposed Action of adding four KC-135 Stratotanker aircraft and associated supporting active-duty personnel to form an Active Associate Squadron at Eielson AFB. All four additional airframes would be "primary" aircraft and authorized for mission performance. The four airframes would be stationed at the installation in phases, with the first aircraft arriving in FY2023 and the final aircraft arriving in FY2025. The existing KC-135 fleet logs two sorties per day and approximately 1,300 hours of flying time per year. The Proposed Action is estimated to increase the installation's KC-135 annual operations by 200%. Aircraft operations would occur within existing airspace and training areas currently utilized by the existing KC-135 fleet at Eielson AFB. The Proposed Action would include 18 associated construction, demolition and renovation projects to provide the necessary infrastructure to support the incoming aircraft, personnel and other equipment. Table 1 lists the proposed projects associated with the KC-135 restationing effort.

The purpose of the Proposed Action is to optimize Air Force capabilities throughout the region to support the National Defense Strategy (NDS) by defending the homeland, competing when necessary to maintain favorable regional balances of power, and ensuring common domains remain free and open. Air operations and missions out of Eielson AFB are critical to the success of accomplishing the NDS. Eielson's Airmen have operational experience over the Arctic, a region of increasingly important strategic interest as the polar icecap melts and the region becomes accessible to more nations. An increase in refueling capacity, provided by the 168th Wing (168 WG) KC-135 fleet, is necessary to ensure that increasing mission needs in the Arctic are met in support of the NDS.

Table 1. Projects Associated with the Proposed Action

TYPE OF PROJECT	FACILITY	DESCRIPTION	AREA OF DISTURBANCE (Square Feet)
Construction	Aerospace Ground Equipment (AGE) Warm Storage	Addition of space to accommodate additional AGE requiring warm storage	7,500
Construction	9-Bay Vehicle Warm Storage	Specialized vehicle warm storage to accommodate +11 vehicles	9,000
Construction	CTK/Maintenance Storage	Meet support requirement for a secure flightline CTK area; enable consolidation of individual shop CTKs, generating space for incoming personnel	4,500
Construction	Maintenance Admin	Support requirement of MXG administration personnel (+20 seats)	4,000
Construction	OG Parking	Parking area to accommodate additional personnel at Squad Operations Building 3129 (+50 stalls)	16,100
Construction	Fuel Receipt Tank	New fuel tank and valves with capacity 420k gallons to meet need for increased fuel storage capacity with incoming aircraft	26,000
Construction	96-Man Dormitory	Dormitory to provide lodging for incoming airmen (+96 personnel)	18,500
Construction	96-Man Dormitory Parking	Addition of 72 parking stalls and associated sidewalks	38,000
Construction	96-Man Dormitory Fire Lane	Asphalt concrete pavement area for the gated Fire Lane	10,000

TYPE OF PROJECT	FACILITY	DESCRIPTION	AREA OF DISTURBANCE (Square Feet)
Construction	Maintenance Hangar	58,000 SF hangar to provide needed space for short-term day maintenance. Can house aircraft during winter months. Includes building footprint, apron, POV parking, and paved areas around hangar	188,000
Demolition	Bldg 1173 Tug & De-icer Warm Storage	Demolition of building to make space for construction of De-icer Complex	7,500
Demolition	Bldg 1174 Refueling Pump Station	Demolition of building to make space for construction of De-icer Complex	7,500
Renovation	Bldg 1168 Maintenance	Addition of space for NDI and corrosion control	8,500
Renovation	Bldg 1171 Fuel Cell Hangar	Addition of administration area to accommodate +7 personnel and space to prevent cross-contamination of dirty/clean areas	5,000
Renovation	Bldg 1172 AGE Warm Storage	Addition of space to accommodate additional AGE requiring warm storage	4,686
Renovation	Bldg 3129 Squad Ops	Addition of operational workspace to accommodate incoming personnel (+53 seats)	15,200
Renovation	Bldg 3229 Fuel/Fire Vehicle Maintenance	Alteration for the fuel and fire systems maintenance facility; accommodate +6 vehicles and +3 personnel	6,800
Renovation	De-icer Tank	Repair/replace existing de-icer tank that is not operational due to contamination; additional de-icer capacity needed to support incoming aircraft	0

Affected Environment

The affected environment includes the portion of Eielson AFB where the additional KC-135s would be housed and where the associated construction/demolition/renovation projects on the installation would take place, as well as the northern portion of the Joint Pacific Alaska Range Complex (JPARC) airspace used by Eielson AFB aircraft.

Eielson AFB is located within the Yukon-Tanana Uplands ecoregion that is characterized by rounded mountains and hills of boreal forest or taiga habitats. These boreal forests are dominated by woodland evergreen species of black spruce *(Picea mariana*) and white spruce (*Picea glauca*). Large stands of deciduous forests that include balsam poplar (*Populus balsamifera*), paper birch (*Betula papyrifera*), and quaking aspen (*Populus tremuloides*) are found in boreal forests on and surrounding Eielson AFB. The on-base developed areas have been planted with a variety of native and introduced plant species. These developed areas are landscaped and maintained by Eielson AFB.

In addition to Yukon-Tanana Uplands, portions of the airspace that Eielson AFB aircraft use are within the Tanana-Kuskokwim Lowlands ecoregion, which is characterized by gentle topography, patches of impermeable permafrost, and poor soil drainage. Bogs and fens and boreal, broadleaf, and coniferous forests dominate the landscape. Patterns of vegetation are determined by a variety of natural influences, including climate, topography (slope, aspect, and elevation), glaciation, flooding, depth to water table, permafrost, and fire. Forest cover is diverse and includes stands of white spruce, paper birch, quaking aspen, balsam poplar, black spruce, and spruce/hardwood, which is a mixture of the above species and is predominant in lowland areas. Scrub communities are dominated by shrubs and occur at high elevations, in small stream valley bottoms and as “pioneer” vegetation on disturbed sites, including areas recovering from fire. Vegetation in the flats is dominated by lowland bogs and fens comprised of low shrubs, herbs, and sedges; and thermokarst forests, which consist primarily of open, stunted birch and black spruce stands.

Approximately 52% of Eielson AFB is wetlands, composed of 9,453 acres of vegetated wetlands and 792 acres of lakes, ponds, and streams. These wetlands are the result of natural processes leading to heavily saturated and wet soil conditions, such as permafrost, precipitation and snowmelt flooding or filling many standing water bodies and depressions in the topography, making conditions favorable for wetland areas to occur. Observed vegetated wetlands on Eielson AFB are dominated by black spruce. Brush and groundcover vegetation in black spruce wetlands are often comprised of bog rosemary (*Andromeda polifolia*), low bush cranberry (*Vaccinium vitis-idaea*), and thick layers of moss. A survey conducted by Stantec Consulting Services Inc. on 22 September 2021 concluded that there are no wetlands within the affected environment for the Proposed Action.

A variety of bird, mammal, and fish species inhabit areas within the affected environment. Eielson AFB is located in the Tanana Valley, which provides habitat for year-round resident bird species, as well as summer-breeding habitat for various migratory bird species. Bird species occurring on Eielson AFB include, but are not limited to, the great horned owl (*Bubo virginianus*), northern goshawk (*Accipiter gentilis*), Canada goose (*Branta canadensis*) ruffed grouse (*Bonasa umbellus*), and willow ptarmigan (*Lagopus lagopus*). More than 30 mammal species have been identified at Eielson AFB including moose (*Alces alces*), black bear (*Ursus americanus*), marten (*Martes americana*), red squirrel (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus americanus*), and beaver (*Castor canadensis*). Lakes, ponds, rivers, and streams are abundant in the Tanana Valley and provide aquatic habitat for multiple fish species. Commonly observed fish species include king salmon (*Oncorhynchus tshawytscha*), rainbow trout (*Oncorhynchus mykiss*), arctic grayling (*Thymallus arcticus*), and northern pike (*Esox Lucius*).

Threatened, Endangered, and Candidate Species and Critical Habitat

The Eielson AFB Integrated Natural Resource Management Plan (INRMP) and the USFWS Information for Planning and Consultation (IPaC) system (Attachment 2), https://ipac.ecosphere.fws.gov/, were reviewed to determine if any federally listed, proposed, or candidate species, or their habitats, could potentially occur in the vicinity of the Proposed Action. No federally listed, proposed, or candidate species, or their habitats, have the potential to occur within the boundaries of Eielson AFB.

Other Species of Special Concern

Several avian species of particular concern, either because they appear on the USFWS Birds of Conservation Concern list or warrant special attention in the project location (e.g., eagles), have the potential to occur both on Eielson AFB and under the airspace. Per the USFWS IPaC, accessed on 9 May 2022, the species include American golden-plover (*Pluvialis dominica*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), gray-headed chickadee (*Poecile cinctus lathami*), Hudsonian godwit (*Limosa haemastica*), lesser yellowlegs (*Tringa flavipes*), and olive-sided flycatcher (*Contopus cooperi*).

Bird dispersal and data collection for the Eielson AFB Bird-Wildlife Aircraft Strike Hazard (BASH) Program is contracted with the U.S. Department of Agriculture/Animal and Plant Health Inspection Service, Wildlife Services (USDA/WS). The Eielson AFB Migratory Bird Treaty Act (MBTA) Depredation Permit is maintained and implemented by USDA/WS personnel for the 354 FW (Attachment 4 – Federal Permits MB212698-0 and MB717522-0 and State Permit 21-039; permit renewals pending). Over the past 11 years, aircraft operating to and from Eielson AFB have averaged 5.5 bird strikes per year (Attachment 3). Most documented incidents were detected during post-flight aircraft inspections. The species identified during the four identified BASH incidents in 2021 were common redpoll (*Acanthis flammea*), hoary redpoll (*Acanthis hornemanni*), white-winged crossbill (*Loxia leucoptera*), violet-green swallow (*Tachycineta thalassina*), and horned lark (*Eremophila alpestris*). None of the bird species of special concern were involved in the incidents.

Although eagles have been observed at Eielson AFB, they are not known to nest on the installation.

Analysis of the Effects of the Proposed Action

Because there are no federally listed species or critical habitat in the project area, this section will focus on the effects of the Proposed Action on avian species.

It is assumed that applicable flight restrictions, operations limitations, and seasonal adjustments prescribed in the 11th Air Force Alaska Airspace Handbook would continue under the Proposed Action. General noise levels within airspace used by KC-135s would negligibly increase. The number of sonic booms is not expected to increase above the No Action Alternative, as the KC-135 does not achieve a speed greater than that of sound. Consequently, significant impacts to avian species of special concern would not be anticipated.

Under the Proposed Action, the additional KC-135s would operate in the same airspace environment as the current aircraft and flight patterns would remain unchanged; however, KC-

135 operations occurring in northern JPARC airspace would increase by 200% over the No Action Alternative. An increase in airspace operations could result in direct mortality of birds involved in an aircraft collision; however, the overall potential for bird-aircraft strikes is not anticipated to be statistically different following the restationing of the KC-135s. KC-135 operations would not be expected to have a significant adverse effect on bird species of special concern due to the continued implementation of responsibilities identified in the Eielson AFB Bird and Wildlife Aircraft Strike Hazard (BASH) Plan, including:

- Coordinate with USDA/WS to determine if bird avoidance dates, normally April 15 – May 15 (spring migration) and August 15 – September 20 (fall migration), need to be modified in response to significant changes in the local bird population or migratory activity.
- Engage in constant communication between the USDA/WS and 354 CES/CEIEA to determine the best solution to any wildlife that may pose a threat to aircraft.
- Maintain applicable USDA Federal Migratory Bird Depredation Permits in accordance with AFI 91-202, The USAF Mishap Prevention Program (as supplemented by PACAF).
- Obtain federal and state permits required for depredation, salvage, collection, and possession of all migratory or local species. Provide guidance and support for biological monitoring of wildlife populations and habitat management to improve technical advice for wildlife and vegetation management programs.
- Advise Air Traffic Control or the Supervisor of Flying, if on duty, of bird activity observed on or near the airfield or in the traffic pattern.
- Monitor bird/wildlife population, grass height, and standing water within the Airfield Zone and report problems to the appropriate Office of Primary Responsibility for modifying or eliminating the problem.
- Limit the minimum altitude to 1,000 feet above ground level when any of the following occur:
    - High daily bird survey numbers
    - Flocking birds observed in Class D airspace
    - Moderately increased levels of birds are observed in the Eielson AFB Bird Exclusion Zone
- From approximately April to the end of September, USDA/WS detection and dispersal teams will manage wildlife in accordance with guidance as stated in the USDA/WS Wildlife Hazard Management Protocol (29 April 2019) and the Memorandum of Understanding between the USDA/WS and Eielson AFB.
- Periodic habitat surveys should be conducted in Eielson AFB Exclusion Zones to identify major habitat types available to birds, and update maps based on these surveys as local land uses and habitat conditions change.

If needed to accommodate mission requirements and subject to funding, the USAF may coordinate with the USFWS to establish habitat use models and/or conduct bald and golden eagle nest surveys to establish low flying (500 feet above ground level) areas outside of eagle habitat during the nesting season (March 15 – September 30) to comply with the Bald and Golden Eagle Protection Act (BGEPA).

During construction, to avoid impacts to nesting birds, vegetation removal from suitable nesting habitat should take place outside of the nesting season, as identified by the Eielson

Natural Resources Office in the INRMP. Once construction is completed, disturbed areas would rapidly reseed naturally, and over time would return to their pre-existing condition.

Determination of Effects from the Proposed Action

It is anticipated that the minimal increase in BASH potential would be mitigated by the fact that KC-135 aircrews operating in JPARC airspace would be required to follow the permits noted above and applicable procedures outlined in the Eielson AFB BASH Plan, and the fact that the majority of its flight time is spent at higher altitudes. The USAF would continue to minimize potential adverse effects to bald and golden eagles protected under the MBTA and the BGEPA by implementing the Eielson AFB BASH Plan, using Air Force tools (e.g., bird avoidance model and Avian Hazard Advisory System), and cooperating with local USDA/WS.

Eagles are found throughout the year on base; however, it is not anticipated that there would be adverse effects to these species or ground-nesting species, because most of the Proposed Action would take place in already developed and/or disturbed areas. The habitat that would be removed is not suitable for nesting and there is abundant habitat in the adjacent Tanana River valley to support these species.

Other actions that would avoid adverse impacts to birds of special concern is the continued communication of visual observations of migrating birds between pilots and range control personnel to reduce the risk of mid-air collisions and disturbance to migrating birds. Such protocols and adherence to the current BASH plan would continue under the Proposed Action and would help reduce any adverse impacts to migrating birds.

For these reasons, we conclude that implementation of the Proposed Action or the No Action Alternative *may affect, but is not likely to adversely affect* avian species of special concern with ranges that could extend under the northern JPARC airspace. Because there are no federally listed, proposed, or candidate species, or their habitats with the potential to occur within the boundaries of Eielson AFB, the Proposed Action *will have no effect on* federally listed species. The USAF respectfully requests concurrence with this determination in compliance with Section 7 of the ESA. When complete, copies of the draft EA will be forwarded for your review.

If you have any questions or concerns, please contact Ronald Gunderson, Natural/Cultural Resources Manager, 354 CES/CEIEA, at ronald.gunderson@us.af.mil or (907) 377-5182. Please provide written comments, concurrence, or other information regarding the action, within 30 days from receipt of this letter, if possible. Thank you in advance for your assistance in this effort.

Sincerely,

BURKE.JAMIE.LYN.1604772067

Digitally signed by BURKE.JAMIE.LYN.1604772067
Date: 2022.09.13 16:13:06 -08'00'

Jamie Burke, GS-11, DAF

4 Attachments:
1. Map of Proposed Action Area
2. USFWS Species List (Project Codes 2022-0001721 and 2022-0012403)
3. Bird-Aircraft Strikes at Eielson AFB (2011-2021)
4. USFWS and Alaska Department of Fish & Game Hazing and Depredation Permits

cc:
PACAF/A4/A6/A7

Attachment 1. Map of Proposed Action Area

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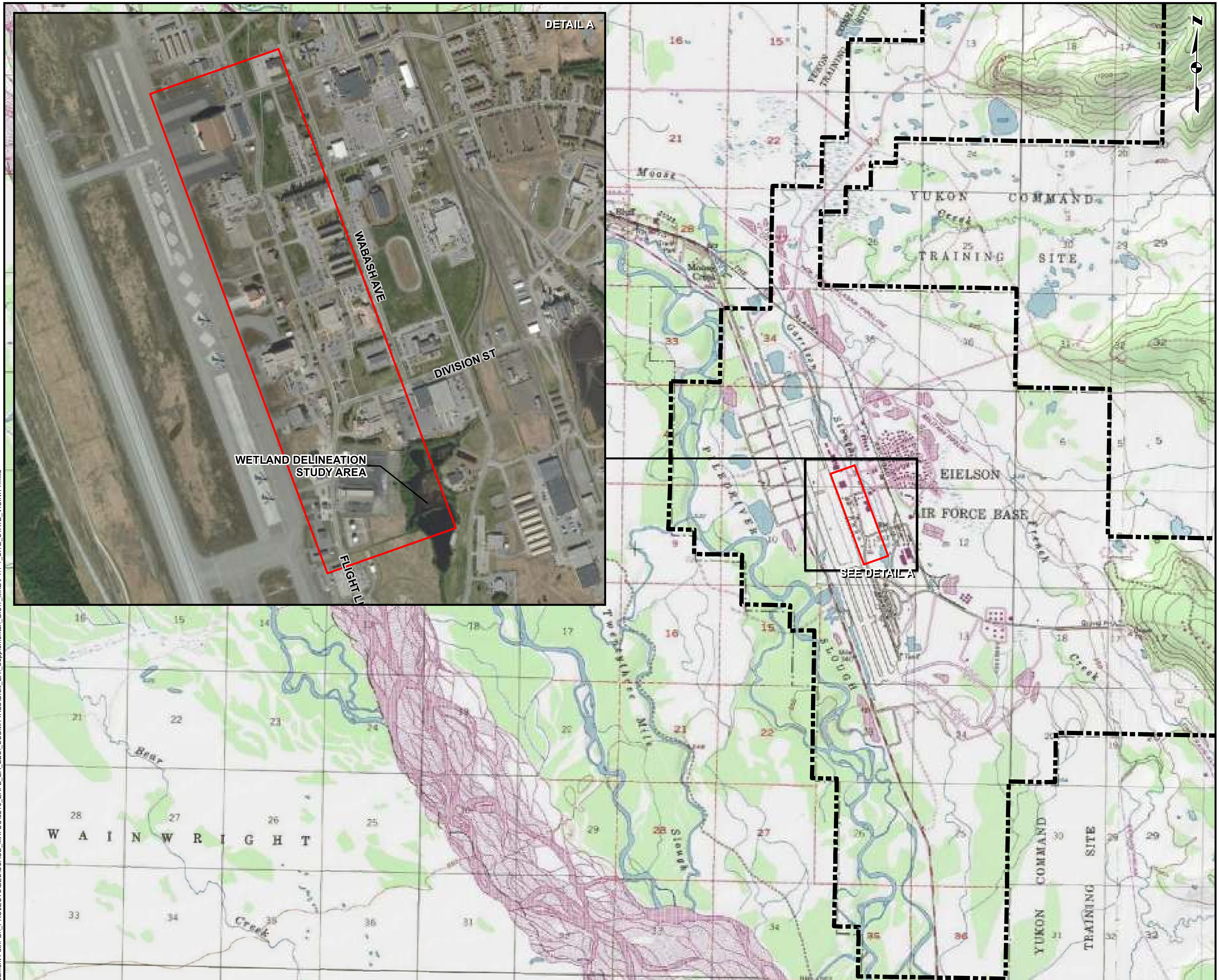
1 INCH

EA FOR REDISTRIBUTION OF KC-135 STRATOTANKER AIRCRAFT

EIELSON AIR FORCE BASE, ALASKA

SITE LOCATION AND VICINITY



Legend

Approximate Region of Influence

Installation Boundary

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

ALASKA STATE PLANE ZONE 3. U.S. SURVEY FEET

HORIZONAL DATUM: NAD83(2011) | VERTICAL DATUM: NAVD88

1 0.5 0 1 2

Miles

PROJECT No.: 321004	DATE: 4/18/2022	FIGURE: 1.1-1
P.M.: M.V.	DRAWN: J.C.	

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Attachment 2. USFWS Species List

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Northern Alaska Fish & Wildlife Field Office
101 12th Avenue
Room 110
Fairbanks, AK 99701-6237
Phone: (907) 456-0203 Fax: (907) 456-0208

In Reply Refer To: May 09, 2022
Project Code: 2022-0001721
Project Name: EAFB KC-135 Redistribution (Base Only)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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:

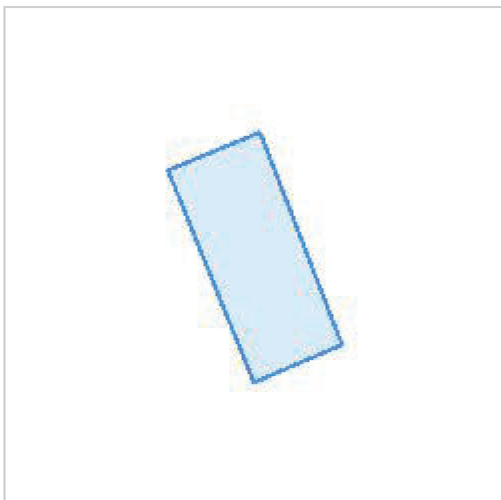
Northern Alaska Fish & Wildlife Field Office
101 12th Avenue
Room 110
Fairbanks, AK 99701-6237
(907) 456-0203

Project Summary

Project Code: 2022-0001721
Event Code: None
Project Name: EAFB KC-135 Redistribution (Base Only)
Project Type: Military Operations
Project Description: The Department of the Air Force proposes to increase the size of its existing Air National Guard KC-135 Stratotanker squadron (168th Air Refueling Wing) at Eielson Air Force Base, Alaska (EAFB) by adding an active-duty component to the unit. The department proposes to add four additional KC-135s and up to 220 additional active-duty personnel, making it a total force unit and increasing the squadron's total KC-135 aircraft to 12. The personnel will be reassigned from within the Air Force. The area of expansion is along the northern flight line area and existing Air National Guard Campus on Eielson. To support the Proposed Action, at least 12 facilities will need to be built, renovated, or add/altered to accommodate the additional aircraft and mission.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@64.67068805,-147.0785632242401,14z



Counties: Fairbanks North Star County, Alaska

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Feb 1 to Sep 30
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds May 1 to Aug 15

NAME	BREEDING SEASON
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

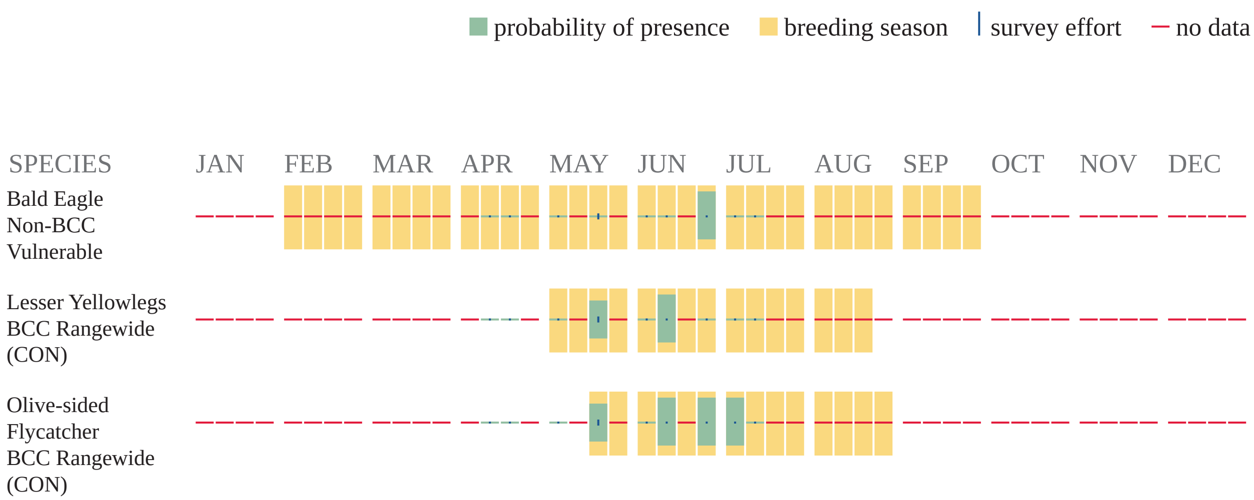
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities,

should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPaC User Contact Information

Agency: Brice Solutions LLC
Name: Mandy Hope
Address: 3700 Centerpoint Dr Suite 8133
City: Anchorage
State: AK
Zip: 99503
Email mandy.hope@bricesolutions.com
Phone: 9072752912

Lead Agency Contact Information

Lead Agency: Air Force

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Northern Alaska Fish & Wildlife Field Office
101 12th Avenue
Room 110
Fairbanks, AK 99701-6237
Phone: (907) 456-0203 Fax: (907) 456-0208

In Reply Refer To: May 09, 2022
Project Code: 2022-0012403
Project Name: EAFB KC-135 Redistribution (Northern JPARC Airspace)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Note: IPaC has provided all available attachments because this project is in multiple field office jurisdictions.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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:

Northern Alaska Fish & Wildlife Field Office
101 12th Avenue
Room 110
Fairbanks, AK 99701-6237
(907) 456-0203

This project's location is within the jurisdiction of multiple offices. However, only one species list document will be provided for all offices. The species and critical habitats in this document reflect the aggregation of those that fall in each of the affiliated office's jurisdiction. Other offices affiliated with the project:

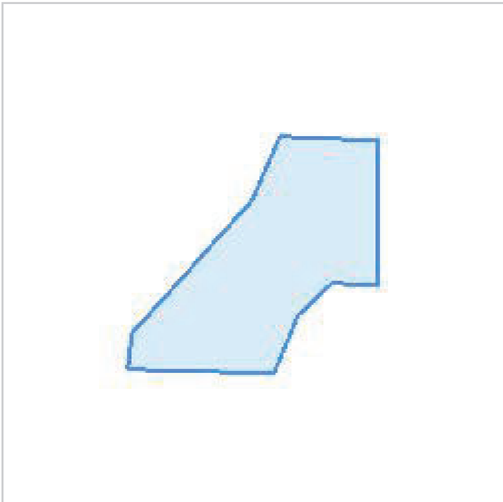
Anchorage Fish & Wildlife Field Office
4700 Blm Road
Anchorage, AK 99507
(907) 271-2888

Project Summary

Project Code:	2022-0012403
Event Code:	None
Project Name:	EAFB KC-135 Redistribution (Northern JPARC Airspace)
Project Type:	Military Operations
Project Description:	The Department of the Air Force proposes to increase the size of its existing Air National Guard KC-135 Stratotanker squadron (168th Air Refueling Wing) at Eielson Air Force Base, Alaska (EAFB) by adding an active-duty component to the unit. The department proposes to add four additional KC-135s and up to 220 additional active-duty personnel, making it a total force unit and increasing the squadron's total KC-135 aircraft to 12. The personnel will be reassigned from within the Air Force. The area of expansion is along the northern flight line area and existing Air National Guard Campus on Eielson. To support the Proposed Action, at least 12 facilities will need to be built, renovated, or add/altered to accommodate the additional aircraft and mission.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@64.4642409,-144.6819595084196,14z



Counties: Alaska

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

FACILITY NAME	ACRES
YUKON FLATS NATIONAL WILDLIFE REFUGE https://www.fws.gov/refuges/profiles/index.cfm?id=75635	9,096,600.366

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 15
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Feb 1 to Sep 30

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Gray-headed Chickadee *Poecile cinctus lathami* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 10
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Jul 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds May 1 to Aug 15
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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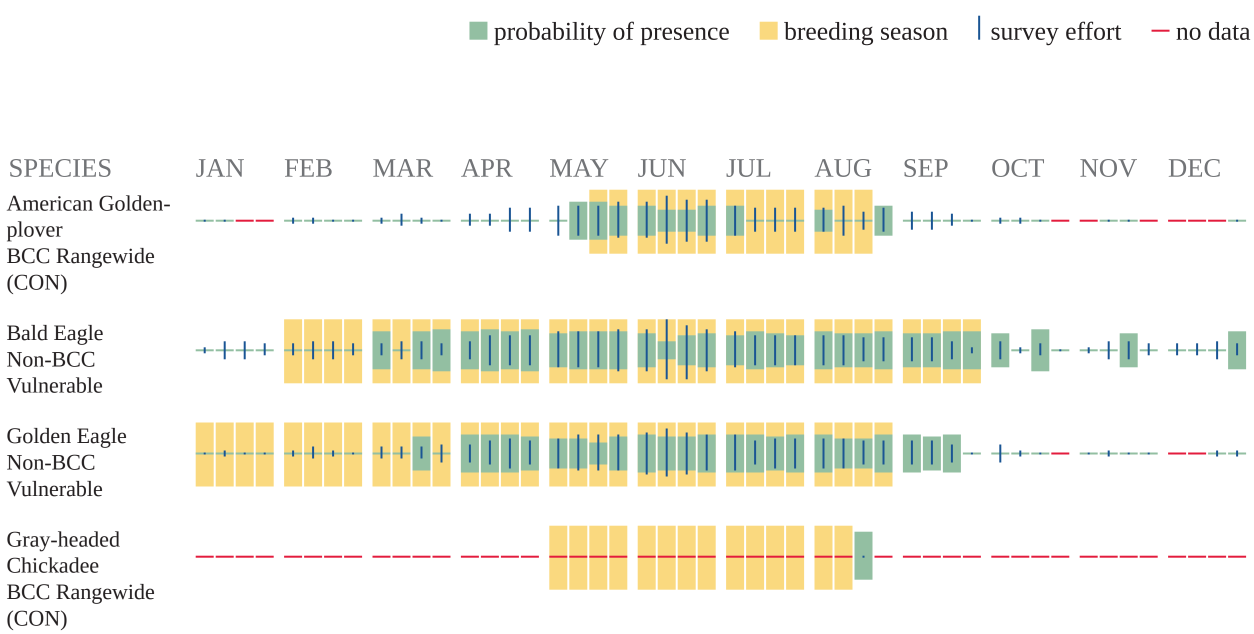

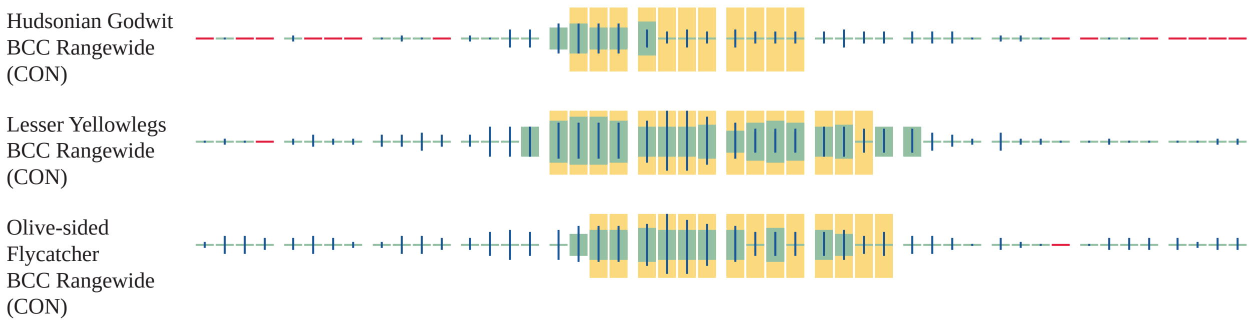

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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides

birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

Due to your project's size, the list below may be incomplete, or the acreages reported may be inaccurate. For a full list, please contact the local U.S. Fish and Wildlife office or visit https://www.fws.gov/wetlands/data/mapper.HTML

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1/SS1A
- PEM1C
- PEM1/SS4B
- PEM1B
- PEM1/USC
- PEM1/SS1C
- PEM1/SS1Cb
- PEM1/SS1B

FRESHWATER POND

- PAB3H
- PAB3F
- PAB3Hb

LAKE

- L1UBH
- L2AB3H

IPaC User Contact Information

Agency: Brice Solutions LLC
Name: Mandy Hope
Address: 3700 Centerpoint Dr Suite 8133
City: Anchorage
State: AK
Zip: 99503
Email mandy.hope@bricesolutions.com
Phone: 9072752912

Lead Agency Contact Information

Lead Agency: Air Force

Attachment 3. Bird-Aircraft Strikes at Eielson AFB (2011-2021)

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Wildlife Strikes 2021

Date	Species (#)	Aircraft	Damage	Misc. Info
5/10/2021	Common Redpoll (1) & Hoary Redpoll (1)	A10	None	Found during routine maintenance upon landing. Pilot thinks strike may have occurred in range off Base. (Struck Wing/Rotor & ECM Pods/Pylons)
6/14/2021	White-Winged Crossbill (1)	F35	None	Found during routine maintenance upon landing. (Struck Inside & Outside Engine #2)
7/15/2021	Violet-Green Swallow (1)	F35	None	Found during routine maintenance. Pilot reviewed video footage and observed strike to occur during initial take-off (Struck Radome/Nose)
8/27/2021	Horned Lark (1)	F16	None	Found during routine maintenance. (Struck Tail/Stabilizer/Rudder)

Deploy - Train - Project

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Attachment 4. USFWS and Alaska Department of Fish & Game Hazing and Depredation Permits

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Permit Number: MB212698-0
Effective: 04/01/2018 Expires: 03/31/2023

Issuing Office:

Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Migratory Bird Permit Office
1011 E. Tudor Rd (MS-201)
Anchorage, AK 99503
Tel: 907-786-3693 Fax: 907-786-3927
Email: permitsR7MB@fws.gov

ELIZABETH PATTINSON
Digitally signed by ELIZABETH PATTINSON
Date: 2018.05.16 13:24:44 -08'00'
PERMIT SPECIALIST, MIGRATORY BIRD PERMIT OFFICE - REGION 7

Permittee:

U.S. AIR FORCE
EIELSON AIR FORCE BASE
354 CES/CEIEA 2310 CENTRAL AVENUE, SUITE 100
ATTN: RON GUNDERSON
EIELSON AFB, AK 99702

Name and Title of Principal Officer:
TODD A. ROBBINS - 354 FW VICE COMMANDER

Authority: Statutes and Regulations: 16 USC 668a; 50 CFR Part 13, 50 CFR 22.23.

Location where authorized activity may be conducted:

EIELSON AIR FORCE BASE (to include the Waterfowl Exclusion Zone and the Expanded Bird Exclusion Zone).

Reporting requirements:

You must submit an annual to your Regional Migratory Bird Permit Office report each year, even if you had no activity.

Authorizations and Conditions:

A. General conditions set out in Subpart B of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.

C. Valid for use by permittee named above

D. You are authorized to use non-lethal scare devices, scare tactics or frightening devices to move or disperse bald eagles or golden eagles endangering human safety due to a high risk of a serious bird strike to landing and departing aircraft. You are authorized to use airhorns, pyrotechnics, and drive vehicles with horns as necessary to scare eagles. Pyrotechnics must not be shot directly at the eagles.

E. You must make a continuous effort to eliminate attractants and other physical properties that may draw eagles to airport property.

F. This permit does not authorize the killing, injury or capture of any eagle or the destruction of any young or nests.

G. This permit does not authorize the disturbance of eagles at active nest sites that contain eggs or young or nests.

H. You must notify the permit issuing office at 907-786-3693 within 48 hours of any injury or death of any eagle during project activities.

I. The following subpermittees are authorized: Designated employees of Eielson Air Force Base under the direct supervision of 354 FW Vice Commander Todd Robbins and designated employees of USDA Wildlife Services. In addition, any other person who is (1) employed by or under contract to you for the activities specified in this permit, or (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

In addition, any other person who is (1) employed by or under contract to you for the activities specified in this permit, or (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

Permit Number: MB212698-0
Effective: 04/01/2018 Expires: 03/31/2023

K. You must comply with the attached Standard Conditions for Eagle Depredation Permits. These standard conditions are a continuation of your permit conditions *and must remain with your permit.*

For suspected illegal activity, immediately contact USFWS Law Enforcement at: 907-786-3693 or 800-858-7621

Standard Conditions
Eagle Depredation Permits
50 CFR 22.23

All of the provisions and conditions of the governing regulations at 50 CFR part 13 and 50 CFR part 22.23 are conditions of your permit. Failure to comply with the conditions of your permit could be cause for suspension of the permit. The standard conditions below are a continuation of your permit conditions and must remain with your permit. If you have questions regarding these conditions, refer to the regulations or, if necessary, contact your migratory bird permit issuing office. For copies of the regulations and forms, or to obtain contact information for your issuing office, visit: http://www.fws.gov/migratorybirds/mbpermits.html.

1. Unless otherwise specified on the face of this permit, you may not lethally take any bald eagle or golden eagle under this permit. Eagles may be taken only by the method(s) specified on the face of your permit. [*Note: Explosive Pest Control Devices (EPCDs) are regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). If you plan to use EPCDs, you require a Federal explosives permit, unless you are exempt under 27 CFR 555.141. Information and contacts may be found at* www.atf.gov/explosives/how-to/become-an-fel.htm.]

2. If you encounter an eagle with a Federal band issued by the U.S. Geological Survey Bird Banding Laboratory, Laurel, MD, report the band number to 1-800-327-BAND (2263) or http://www.reportband.gov.

3. This permit does not authorize take or release of any bald eagle or golden eagle on Federal lands without additional prior written authorization from the applicable Federal agency, or on State lands or other public or private property without prior written permission or permits from the landowner or custodian.

4. Unless otherwise specified on the face of the permit, any bald eagle or golden eagle taken under this permit must be promptly turned over to a U.S. Fish and Wildlife Service (Service) agent or other wildlife law enforcement officer designated on the face of the permit.

5. Any person exercising the authorities of this permit must carry a legible copy of this permit, *including these Standard Conditions*, and display it upon request to any State or Federal officer when exercising its authority.

6. You must maintain records as required in 50 CFR 13.46. All records relating to the permitted activities must be kept at the location indicated in writing by you to the migratory bird permit issuing office.

7. Acceptance of this permit authorizes the Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.

8. You may not conduct the activities authorized by this permit if doing so would violate the laws of the applicable State, county, municipal or tribal government or any other applicable law.

(EADP 12/3/2011)

Permit Number: MB717522-0
Effective: 04/01/2020 Expires: 03/31/2021

Issuing Office:

Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Migratory Bird Permit Office
1011 E. Tudor Rd (MS-201)
Anchorage, AK 99503
Tel: 907-786-3693 Fax: 907-786-3927

PERMIT SPECIALIST, MIGRATORY BIRD PERMIT OFFICE - REGION 7

Permittee:

U.S. AIR FORCE
EIELSON AIR FORCE BASE - 354 CES/CEIEA
2310 CENTRAL AVENUE, SUITE 100
ATTN: RON GUNDERSON
EIELSON AFB, AK 99702

Name and Title of Principal Officer:
SHAWN E. ANGER - 354 FW VICE COMMANDER

Authority: Statutes and Regulations: 16 USC 703-712; 50 CFR Part 13, 50 CFR 21.41.

Location where authorized activity may be conducted:

BIRD EXCLUSION ZONE AND WATERFOWL EXCLUSION ZONE
EIELSON AIR FORCE BASE, ALASKA

Reporting requirements:

You must submit an annual to your Regional Migratory Bird Permit Office report each year, even if you had no activity.

Authorizations and Conditions:

A. General conditions set out in Subpart B of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.

C. Valid for use by permittee named above.

D. You must have written authority from the Alaska department of Fish and Game, Juneau, Alaska before exercising any of the authorities granted by this permit.

E. You are authorized to take, temporarily possess, and transport the migratory birds specified below to relieve or prevent injurious situations impacting public safety. All take must be done as part of an integrated wildlife damage management program that emphasizes nonlethal management techniques. You may not use this authority for situations in which migratory birds are merely causing a nuisance. **Permittee must contact the USFWS Permit Office (907-786-3693) within 48 hours when the total lethal take of any raptor species exceeds three birds**.

(1) The following may be lethally taken: Minimum number and species.

(2) The following may be live-trapped and relocated: Minimum number and species.

(3) The following active nests (including eggs) may be destroyed: Minimum number and species.

F. You are authorized in emergency situations only to take, trap, or relocate any migratory birds, nests and eggs, including species that are not listed in Condition D (except bald eagles, golden eagles, or endangered or threatened species) when the migratory birds, nests, or eggs are posing a direct threat to human safety. A direct threat to human safety is one which involves a threat of serious bodily injury or a risk to human life.

Permit Number: MB717522-0
Effective: 04/01/2020 Expires: 03/31/2021

You must report any emergency take activity to your migratory bird permit issuing office at 907-786-3693 within 72 hours after the emergency take action. Your report must include the species and number of birds taken, method, and a complete description of the circumstances warranting the emergency action.

G. You are authorized to salvage and temporarily possess migratory birds found dead or taken under this permit for (1) disposal, (2) transfer to the U.S. Department of Agriculture, (3) diagnostic purposes, (4) purposes of training airport personnel, (5) donation to a public scientific or educational institution as defined in 50 CFR 10.12, (6) donation to persons authorized by permit or regulation to possess them, or (7) donation of migratory game birds only to a public charity (those suitable for human consumption), Any dead bald eagles or golden eagles salvaged must be reported within 48 hours to the National Eagle Repository at (303) 287-2110 and to the migratory bird permit issuing office at 907-786-3693. The Repository will provide directions for shipment of these specimens.

H. Before you salvage any bird killed by suspected illegal activity, you must first contact to the U.S. Fish and Wildlife Service Office of Law Enforcement (OLE) for authorization to salvage that bird. See FWS OLE contact information below.

I. You may use the following methods of take: (1) firearms; (2) nets; (3) registered animal drugs (excluding nicarbazin), pesticides and repellents; (4) falconry abatement; and (5) legal lethal and live traps (excluding pole traps). Birds caught live may be euthanized or transported and relocated to another site approved by the appropriate State wildlife agency, if required. When using firearms, you may use rifles or air rifles to shoot any bird when you determine that the use of a shotgun is inadequate to resolve the injurious situation. You may use paint ball guns to haze birds or deter birds only when other methods of hazing are ineffective.

Anyone who takes migratory birds under the authority of this permit must follow the American Veterinary Medical Association Guidelines on Euthanasia when euthanasia is necessary (http://www.avma.org/issues/animal_welfare/euthanasia.pdf).

J. You may temporarily possess and stabilize sick and injured migratory birds and immediately transport them to a federally licensed rehabilitator for care.

K. The following subpermittees are authorized: Designated employees of Eielson Air Force Base under the direct supervision of 354 FW Vice Commander Shawn Anger and designated employees of USDA Wildlife Services.

In addition, any other person who is (1) employed by or under contract to you for the activities specified in this permit, or (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

L. You and any subpermittee(s) must comply with the attached Standard Conditions for Migratory Bird Depredation Permits. These standard conditions are a continuation of your permit conditions and must remain with your permit.

For suspected illegal activity, immediately contact USFWS Law Enforcement at: 907-786-3311 or 800-858-7621

Standard Conditions
Migratory Bird Depredation Permits
50 CFR 21.41

All of the provisions and conditions of the governing regulations at 50 CFR part 13 and 50 CFR part 21.41 are conditions of your permit. Failure to comply with the conditions of your permit could be cause for suspension of the permit. The standard conditions below are a continuation of your permit conditions and must remain with your permit. If you have questions regarding these conditions, refer to the regulations or, if necessary, contact your migratory bird permit issuing office. For copies of the regulations and forms, or to obtain contact information for your issuing office, visit: http://www.fws.gov/migratorybirds/mbpermits.html.

1. To minimize the lethal take of migratory birds, you are required to continually apply non-lethal methods of harassment in conjunction with lethal control.
   [*Note: Explosive Pest Control Devices (EPCDs) are regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). If you plan to use EPCDs, you require a Federal explosives permit, unless you are exempt under 27 CFR 555.141. Information and contacts may be found at http://www.atf.gov/explosives/how-to/become-an-fel.htm.*]

2. Shotguns used to take migratory birds can be no larger than 10-gauge and must be fired from the shoulder. You must use nontoxic shot listed in 50 CFR 20.21(j).

3. You may not use blinds, pits, or other means of concealment, decoys, duck calls, or other devices to lure or entice migratory birds into gun range.

4. You are not authorized to take, capture, harass, or disturb bald eagles or golden eagles, or species listed as threatened or endangered under the Endangered Species Act found in 50 CFR 17, without additional authorization.

   For a list of threatened and endangered species in your state, visit the U.S. Fish and Wildlife Service's Threatened and Endangered Species System (TESS) at: http://www.fws.gov/endangered.

5. If you encounter a migratory bird with a Federal band issued by the U.S. Geological Survey Bird Banding Laboratory, Laurel, MD, report the band number to 1-800-327-BAND or http://www.reportband.gov.

6. This permit does not authorize take or release of any migratory birds, nests, or eggs on Federal lands without additional prior written authorization from the applicable Federal agency, or on State lands or other public or private property without prior written permission or permits from the landowner or custodian.

7. Unless otherwise specified on the face of the permit, migratory birds, nests, or eggs taken under this permit must be:
   (a) turned over to the U.S. Department of Agriculture for official purposes, or
   (b) donated to a public educational or scientific institution as defined by 50 CFR 10, or
   (c) completely destroyed by burial or incineration, or
   (d) with prior approval from the permit issuing office, donated to persons authorized by permit or regulation to possess them.

8. A subpermittee is an individual to whom you have provided written authorization to conduct some or all of the permitted activities in your absence. Subpermittees must be at least 18 years of age. As the permittee, you are legally responsible for ensuring that your subpermittees are adequately trained and adhere to the terms of your permit. You are responsible for maintaining current records of who you have designated as a subpermittee, including copies of designation letters you have provided.

9. You and any subpermittees must carry a legible copy of this permit, *including these Standard Conditions*, and display it upon request whenever you are exercising its authority.

10. You must maintain records as required in 50 CFR 13.46 and 50 CFR 21.41. All records relating to the permitted activities must be kept at the location indicated in writing by you to the migratory bird permit issuing office.

11. Acceptance of this permit authorizes the U.S. Fish and Wildlife Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.

12. You may not conduct the activities authorized by this permit if doing so would violate the laws of the applicable State, county, municipal or tribal government or any other applicable law.

(DPRD - 12/3/2011)

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
P.O. Box 115526
JUNEAU, ALASKA 99811-5526

Permit No. 21-039

Expires: 1/31/2022

PUBLIC SAFETY PERMIT

This permit authorizes Col. Thomas B. Wolfe, U.S. Air Force, Eielson Air Force Base
(person, agency or organization)
of 2258 Central Ave, Suite 100, Eielson AFB, AK 99702-1899 to conduct the following
(address)
activities from January 11, 2021 to January 31, 2022 in accordance with AS 16.05.930.

As provided under 5 AAC 92.033, authority is granted to the permittee and designated subpermittees to haze and take birds, nests, and eggs consistent with federal permit MB717522 (with amendments) within the current Waterfowl Exclusion Zone (WEZ), Bird Exclusion Zone (BEZ), and Mullins Pit area.

The edible meat of any waterfowl killed that is suitable for human consumption shall be salvaged and turned over to Alaska Wildlife Troopers or donated to charity. Carcasses of geese may also be donated to USDA Wildlife Services for export to Hawaii for use in research on wind turbines. Please contact the USFWS, 1412 Airport Way, Fairbanks, Alaska (907-456-0341) prior to disposing of any migratory birds. This permit authorizes the hazing of eagles, but this permit does not authorize the take of eagles or the hazing or take of threatened or endangered species.

Inactive nests and the number of active nests of bank and cliff swallows authorized in federal permits may also be destroyed to protect property and personnel at Eielson Air Force Base. Destruction of previous year's nests should occur prior to spring migration and every effort should be made to avoid the destruction of eggs and young. All other conditions are the same as federal permit MB717522 with amendments.

Authority is also granted to haze all mammals from within the flight line fence including airport runways and taxiways and to lethally take big game animals with prior approval of Fairbanks Area Biologists Tony Hollis (907-459-7256) or Mark Nelson (907-459-7259). Authority is further granted to haze, live-trap and relocate, and/or lethally take woodchucks and to lethally take foxes and coyotes from within the airfield fence line. Authority is also granted to kill all species classified as deleterious exotic wildlife (starling, house sparrows, pigeons, raccoons, rats, mice, gerbils, other murid rodents, and Belgian hares) on the grounds of Eielson AFB. Authority is granted to haze, live-trap and relocate on base grounds, or lethally take red squirrels that damage buildings or equipment or present a hazard to safe operations. All lethal take of animals must be humane.

(Continued on Page 2)

REPORT DUE January 20, 2022 . The report shall include the information specified above.

GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS

1. **This permit must be carried by person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.**
2. **No specimens taken under authority hereof may be sold or bartered. All specimens must be deposited in a public museum or a public scientific or educational institution unless otherwise stated herein. Subpermittees shall not retain possession of live animals or other specimens.**
3. **The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.**
4. **Permits will not be renewed until detailed reports, as specified above, have been received by the department.**
5. **UNLESS SPECIFICALLY STATED HEREIN, THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens or the taking of specimens in areas otherwise closed to hunting and fishing; without appropriate licenses required by state regulations; during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.**

Ryan Scott

Ryan Scott, Assistant Director
Division of Wildlife Conservation

January 11, 2021
Date

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
P.O. Box 115526
JUNEAU, ALASKA 99811-5526
PUBLIC SAFETY PERMIT

Permit No. 21-039

Permittee: Col. Thomas B. Wolfe
U.S. Air Force, Eielson Air Force Base
2258 Central Ave, Suite 100
Eielson AFB, AK 99702-1899

The primary permittee may designate subpermittees to conduct activities authorized by this permit. The primary permittee is responsible for the actions of all subpermittees and for ensuring their compliance with the conditions of this permit. Prior to conducting activities authorized by this permit, all subpermittees shall complete an 8-hour airport wildlife hazard management training or refresher course provided by USDA Wildlife Services or by an ADOT&PF trainer annually trained by USDA Wildlife Services. Persons conducting activities authorized by this permit are exempt from Fish & Game licensing requirements of AS 16.05.330.

REPORTING REQUIREMENTS

A report of activities must be submitted electronically on a form provided by the Department to the Permits Section (dfg.dwc.permits@alaska.gov) by the date specified on Page 1 of this permit. The report must include: 1) for birds, a monthly summary (by species) of numbers of birds hazed or killed and the disposition of all carcasses; 2) for nests, the date of removal, species, number of eggs or young in the nest, and the final disposition of the nest, eggs, and young; 3) for mammals, a daily summary of the species and number of mammals hazed or killed, the method of hazing or take, and the disposition of all carcasses; and 4) a complete list of all subpermittees.

A separate written report must be submitted for lethal take of any species not authorized by this permit. The report must include a detailed explanation of the circumstances surrounding the take, the disposition of the carcass and any edible meat, and a description of the steps that will be taken to avoid similar incidents in the future.

A CURRENT FEDERAL PERMIT AND THIS PERMIT MUST BE IN POSSESSION WHEN CONDUCTING AUTHORIZED ACTIVITIES.

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From: Ajmi, Amal R <amal_ajmi@fws.gov>
Sent: Tuesday, October 4, 2022 11:39 AM
To: BURKE, JAMIE L GS-11 USAF PACAF 354 CES/CEIE <jamie.burke.3@us.af.mil>
Cc: Henszey, Bob <bob_henszey@fws.gov>; Bjornlie, Nichole L <nichole_bjornlie@fws.gov>
Subject: [Non-DoD Source] EAFB EA - KC135 aircraft

Morning Jamie,

Thank you very much for spending time with me this morning discussing the proposed action. I appreciate you clarifying some things with me, and I look forward to receiving the EA for a full review of the action.

As agreed, the USFWS will hold all comments until the EA is received and reviewed to provide EAFB with the most comprehensive comments on the proposed action.

Respectfully,

Amal Ajmi
Fish & Wildlife Biologist
Conservation Planning Assistance
Northern Alaska Fish and Wildlife Field Office US Fish & Wildlife Service
101 12th Ave, Room 110
Fairbanks, AK 99701
907-456-0324 (Office)
907-456-0208 (Fax)
amal_ajmi@fws.gov <mailto:amal_ajmi@fws.gov> "You haven't seen a tree until you've seen it's shadow from the sky". Amelia Earhart

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APPENDIX B
ACAM ANALYSIS REPORT

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

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

a. Action Location:
Base: EIELSON AFB
State: Alaska
County(s): Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Redistribution of KC-135 Stratotanker Aircraft to Eielson Air Force Base, Alaska

c. Project Number/s (if applicable):

d. Projected Action Start Date: 5 / 2023

e. Action Description:

This EA evaluates the potential environmental impacts that may arise from the addition of up to four KC-135 Stratotanker aircraft and associated approximately 254 supporting active-duty personnel to form an "Active Associate Squadron" at Eielson AFB. The Proposed Action would result in the following changes:
1. An increase in the number of KC-135s stationed at Eielson AFB
2. An increase in the number of KC-135 support personnel
3. An increase in KC-135 operations and maintenance
4. Construction, demolition, and facility renovation to support increased personnel and operations

f. Point of Contact:
Name: Nikhil Dattatray Ket
Title: Environmental Engineer
Organization: Brice Environmental Services LLC
Email: nket@briceenvironmental.com
Phone Number: +1 (907) 388 7428

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

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

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

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

Analysis Summary:

2023

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	35.180	250	
NOx	21.783	250	
CO	50.817	250	
SOx	2.070	250	
PM 10	7.542	100	
PM 2.5	2.104	100	
Pb	0.000	25	No
NH3	0.019	100	
CO2e	9306.0		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	126.083	250	
NOx	47.584	250	
CO	152.211	250	
SOx	8.162	250	
PM 10	7.600	100	
PM 2.5	6.839	100	
Pb	0.000	25	No
NH3	0.037	100	
CO2e	25200.9		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant 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.

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11/14/2022

Nikhil Dattatray Ket, Environmental Engineer

DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: EIELSON AFB
State: Alaska
County(s): Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Redistribution of KC-135 Stratotanker Aircraft to Eielson Air Force Base, Alaska

- Project Number/s (if applicable):

- Projected Action Start Date: 5 / 2023

- Action Purpose and Need:
The purpose of the Proposed Action is to optimize Air Force capabilities throughout the region to support the National Defense Strategy (NDS) by defending the homeland, competing when necessary to maintain favorable regional balances of power, and ensuring common domains remain free and open. Air operations and missions out of Eielson AFB are critical to the success of accomplishing the NDS. Eielson's Airmen have operational experience over the Arctic, a region of increasingly important strategic interest as the polar icecap melts and the region becomes accessible to more nations. An increase in refueling capacity, provided by the 168 WG KC-135 fleet, is necessary to ensure that increasing mission needs in the Arctic are met in support of the NDS.
If this action is not implemented, the existing KC-135s will be unable to adequately support the fighter squadrons during long-range missions over the Pacific Ocean, North Pole, and Joint Pacific Alaska Range Complex (JPARC) regions. Existing KC-135s will be tapped to maximum potential during real-world events, which could result in insufficient refueling coverage and availability for mission needs, potentially leading to mission delays or cancellations, and overall failure to meet the objectives of the NDS.

- Action Description:
This EA evaluates the potential environmental impacts that may arise from the addition of up to four KC-135 Stratotanker aircraft and associated approximately 254 supporting active-duty personnel to form an "Active Associate Squadron" at Eielson AFB. The Proposed Action would result in the following changes:
1. An increase in the number of KC-135s stationed at Eielson AFB
2. An increase in the number of KC-135 support personnel
3. An increase in KC-135 operations and maintenance
4. Construction, demolition, and facility renovation to support increased personnel and operations

- Point of Contact
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Title: Environmental Engineer
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- Activity List:

	Activity Type	Activity Title
2.	Personnel	Added active-duty personnel
3.	Aircraft	4 additional KC-135 Beddown (LTO Operations)
4.	Construction / Demolition	Construction of 96 Man Dormitory
5.	Construction / Demolition	OG Parking
6.	Tanks	Fuel Receipt Tank
7.	Construction / Demolition	Aerospace Ground Equipment Warm Storage
8.	Construction / Demolition	9-Bay Vehicle Warm Storage

9.	Construction / Demolition	CTK/Maintenance Storage
10.	Construction / Demolition	Maintenance Admin
11.	Construction / Demolition	96-Man Dormitory Parking
12.	Construction / Demolition	96-Man Dormitory Fire Lane
13.	Construction / Demolition	Maintenance Hangar
14.	Construction / Demolition	Bldg 1173 Tug & De-icer Warm Storage
15.	Construction / Demolition	Bldg 1174 Refueling Pump Station
16.	Construction / Demolition	Exterior renovation of Bldg 1168 Maintenance
17.	Construction / Demolition	Exterior renovation of Bldg 1171 Fuel Cell Hangar
18.	Construction / Demolition	Exterior renovation of Bldg 1172 AGE Warm Storage
19.	Construction / Demolition	Exterior renovation of Bldg 3129 Squad Ops
20.	Construction / Demolition	Exterior renovation of Bldg 3229 Fuel/Fire Vehicle Maintenance
21.	Aircraft	4 additional KC-135 Beddown (Close Pattern)

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

2. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Added active-duty personnel

- Activity Description:
Eielson AFB would receive approximately 254 supporting active-duty personnel

- Activity Start Date
Start Month: 10
Start Year: 2023

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.405976
SO_x	0.002335
NO_x	0.316072
CO	7.614550
PM 10	0.009365

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.007882
Pb	0.000000
NH_3	0.037454
CO_2e	538.7

2.2 Personnel Assumptions

- Number of Personnel

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Active Duty Personnel: 242
Civilian Personnel: 12
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

2.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

2.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

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

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 4 additional KC-135 Beddown (LTO Operations)

- Activity Description:
An increase in the number of KC-135s stationed at Eielson AFB

- Activity Start Date
Start Month: 10
Start Year: 2023

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	120.512807
SO_x	5.094649
NO_x	30.653780
CO	121.966611
PM 10	4.926468

Pollutant	Emissions Per Year (TONs)
PM 2.5	4.433821
Pb	0.000000
NH_3	0.000000
CO_2e	15398.2

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

Pollutant	Emissions Per Year (TONs)
VOC	120.512807
SO_x	5.094649
NO_x	30.653780
CO	121.966611
PM 10	4.926468

Pollutant	Emissions Per Year (TONs)
PM 2.5	4.433821
Pb	0.000000
NH_3	0.000000
CO_2e	15398.2

3.2 Aircraft & Engines

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: KC-135
Engine Model: J57-P-22
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	952.00	88.55	1.07	2.20	79.00	0.16	0.14	3234
Approach	3333.00	1.61	1.07	5.80	7.90	0.93	0.84	3234
Intermediate	6508.00	0.23	1.07	9.50	2.40	1.92	1.73	3234
Military	7460.00	0.12	1.07	11.00	1.90	1.72	1.55	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 4
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 2920
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 14.12
Approach [Approach] (mins): 4.82
Climb Out [Intermediate] (mins): 1.08
Takeoff [Military] (mins): 1.11
Takeoff [After Burn] (mins): 0

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

- Trim Test
Idle (mins): 12
Approach (mins): 27
Intermediate (mins): 9
Military (mins): 12
AfterBurn (mins): 0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3.4 Auxiliary Power Unit (APU)

3.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

3.4.3 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. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of 96 Man Dormitory

- Activity Description:
Dormitory to provide lodging for incoming airmen (+96 personnel)

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.446791
SO_x	0.003109
NO_x	0.939417
CO	1.232202
PM 10	0.618154

Pollutant	Total Emissions (TONs)
PM 2.5	0.036170
Pb	0.000000
NH_3	0.000582
CO_2e	303.9

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 18500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

4.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

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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 Number of Works
NE: Number of Construction Equipment

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

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

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

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

- Worker Trips Vehicle Mixture (%)

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

4.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

4.2.4 Trenching / Excavating Phase Formula(s)

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

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

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

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

2000: Conversion Factor pounds to tons

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

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

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

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

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

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

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

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

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Building Category: Commercial or Retail
Area of Building (ft^2): 18500
Height of Building (ft): 9
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

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

- Vendor Trips Vehicle Mixture (%)

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

4.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171

HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

4.3.4 Building Construction Phase Formula(s)

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

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

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.32 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.32 / 1000): Conversion Factor ft^3 to trips (0.32 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

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

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

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

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

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.05 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.05 / 1000): Conversion Factor ft^3 to trips (0.05 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 96

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

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

- Worker Trips Vehicle Mixture (%)

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

4.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679

LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

4.4.4 Architectural Coatings Phase Formula(s)

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

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

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

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: OG Parking

- Activity Description:
Parking area to accommodate additional personnel at Squad Operations Building 3129 (+50 stalls)

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.120682
SO_x	0.001821
NO_x	0.702564
CO	0.830316
PM 10	0.511252

Pollutant	Total Emissions (TONs)
PM 2.5	0.030745
Pb	0.000000
NH_3	0.000498
CO_2e	180.9

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 16100
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

5.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

5.2 Paving Phase

5.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

5.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 16100

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Construction Exhaust (default)

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

- Vehicle Exhaust

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

5.2.3 Paving Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

5.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

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

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

6. Tanks

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Fuel Receipt Tank

- Activity Description:
New fuel tank and valves with capacity 420k gallons to meet need for increased fuel storage capacity with incoming aircraft

- Activity Start Date
Start Month: 5
Start Year: 2023

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.552120
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

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

6.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Vertical Tank
Tank Height (ft): 35
Tank Diameter (ft): 119
Annual Net Throughput (gallon/year): 420000

6.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * H / 2

VSV: Vapor Space Volume (ft^3)

PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * H / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * H)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

7. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

7.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Aerospace Ground Equipment Warm Storage

- Activity Description:
Addition of space to accommodate additional AGE requiring warm storage

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.169566
SO_x	0.003125
NO_x	0.950864
CO	1.238689
PM 10	0.290100

Pollutant	Total Emissions (TONs)
PM 2.5	0.036378
Pb	0.000000
NH_3	0.000712
CO_2e	309.1

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 7500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day

Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

7.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

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

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

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

7.2 Trenching/Excavating Phase

7.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

7.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

7.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

7.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

- Worker Trips Emissions per Phase

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

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

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

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

7.3 Building Construction Phase

7.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
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): 7500
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

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

- Vendor Trips Vehicle Mixture (%)

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

7.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

7.3.4 Building Construction Phase Formula(s)

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

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

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

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)

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

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

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

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

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

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

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

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

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

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

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

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 9-Bay Vehicle Warm Storage

- Activity Description:
Specialized vehicle warm storage to accommodate 11 vehicles

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.169734
SO_x	0.003129
NO_x	0.953943
CO	1.240405
PM 10	0.334927

Pollutant	Total Emissions (TONs)
PM 2.5	0.036435
Pb	0.000000
NH_3	0.000747
CO_2e	310.5

8.1 Site Grading Phase

8.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

8.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 9000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6

Tractors/Loaders/Backhoes Composite	1	7

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

8.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

8.1.4 Site Grading Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

8.2 Trenching/Excavating Phase

8.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

8.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

8.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

8.2.4 Trenching / Excavating Phase Formula(s)

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

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

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

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

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

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

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

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

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

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)

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

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

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

8.3 Building Construction Phase

8.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

8.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 9000
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

8.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

8.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

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

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

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: CTK/Maintenance Storage

- Activity Description:
Meet support requirement for a secure flightline CTK area; enable consolidation of individual shop CTKs, generating space for incoming personnel

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.169229
SO_x	0.003116
NO_x	0.944706
CO	1.235258
PM 10	0.200445

Pollutant	Total Emissions (TONs)
PM 2.5	0.036266
Pb	0.000000
NH_3	0.000642
CO_2e	306.3

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

- Vehicle Exhaust

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

9.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

9.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

9.2 Trenching/Excavating Phase

9.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 3
Number of Days: 0

9.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

9.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e

LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

9.2.4 Trenching / Excavating Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

NE: Number of Construction Equipment

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

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

9.3 Building Construction Phase

9.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

9.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 4500
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	50.00	50.00	0	0	0	0	0

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

- Vendor Trips Vehicle Mixture (%)

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

9.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

9.3.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

10. Construction / Demolition

10.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Maintenance Admin

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:
Support requirement of MXG administrative personnel (+20 seats)

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.168825
SO_x	0.003106
NO_x	0.937317
CO	1.231140
PM 10	0.185376

Pollutant	Total Emissions (TONs)
PM 2.5	0.036132
Pb	0.000000
NH_3	0.000558
CO_2e	302.9

10.1 Site Grading Phase

10.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

10.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

10.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

10.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

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

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

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

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

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

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

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

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

10.2 Trenching/Excavating Phase

10.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

10.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

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

- Construction Exhaust (default)

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

- Vehicle Exhaust

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

10.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679

LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

10.2.4 Trenching / Excavating Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

10.3 Building Construction Phase

10.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

10.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 4000
Height of Building (ft): 9
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

10.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

10.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

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

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

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

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

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

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

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

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

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

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 96-Man Dormitory Parking

- Activity Description:
Addition of 72 parking stalls and associated sidewalks

- Activity Start Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.138043
SO_x	0.002007
NO_x	0.803173
CO	0.944269
PM 10	1.170993

Pollutant	Total Emissions (TONs)
PM 2.5	0.036902
Pb	0.000000
NH_3	0.000550
CO_2e	199.8

11.1 Site Grading Phase

11.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

11.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 38000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

11.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

11.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

11.2 Paving Phase

11.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

11.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 38000

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

11.2.3 Paving Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

11.2.4 Paving Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)

PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 96-Man Dormitory Fire Lane

- Activity Description:
Asphalt concrete pavement area for the gated Fire Lane

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.120488
SO_x	0.001821
NO_x	0.702383
CO	0.830215
PM 10	0.329201

Pollutant	Total Emissions (TONs)
PM 2.5	0.030742
Pb	0.000000
NH_3	0.000496
CO_2e	180.9

12.1 Site Grading Phase

12.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

12.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 10000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

12.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

12.1.4 Site Grading Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

2000: Conversion Factor pounds to tons

12.2 Paving Phase

12.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

12.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 10000

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

12.2.3 Paving Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

12.2.4 Paving Phase Formula(s)

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

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

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

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

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

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

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

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)

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

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

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

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

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

13. Construction / Demolition

13.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Maintenance Hangar

- Activity Description:
58,000 SF hangar to provide needed space for short-term day maintenance. Can house aircraft during winter months. Includes building footprint, apron, POV parking, and paved areas around hangar.

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.276833
SO_x	0.004472
NO_x	1.637930
CO	2.022795
PM 10	1.829048

Pollutant	Total Emissions (TONs)
PM 2.5	0.068004
Pb	0.000000
NH_3	0.002469
CO_2e	475.8

13.1 Site Grading Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

13.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

13.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 58000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

13.1.3 Site Grading Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

13.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

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

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

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

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

13.2 Trenching/Excavating Phase

13.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

13.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

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

- Construction Exhaust (default)

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

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

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- 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

13.2.3 Trenching / Excavating Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

13.2.4 Trenching / Excavating Phase Formula(s)

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

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

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

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

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

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

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

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

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

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

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

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

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

13.3 Building Construction Phase

13.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

13.3.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 58000
Height of Building (ft): 40
Number of Units: N/A

- Building Construction Default Settings

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

- Construction Exhaust (default)

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

- Vehicle Exhaust

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

13.3.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0320	0.0006	0.2612	0.2683	0.0103	0.0103	0.0028	61.065

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0242	0.0003	0.1487	0.1761	0.0067	0.0067	0.0021	25.657

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

13.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

- Vehicle Exhaust Emissions per Phase

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

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

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

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

- Worker Trips Emissions per Phase

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

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

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

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

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

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

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

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

13.4 Paving Phase

13.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

13.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 130000

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

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7

Paving Equipment Composite	2	6
Rollers Composite	1	7

- 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

13.4.3 Paving Phase Emission Factor(s)

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

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0757	0.0014	0.4155	0.5717	0.0191	0.0191	0.0068	132.91
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0483	0.0012	0.2497	0.3481	0.0091	0.0091	0.0043	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

13.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

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

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

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

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

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

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

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

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

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

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

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

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Bldg 1173 Tug & De-icer Warm Storage

- Activity Description:
Demolition of building to make space for construction of De-icer Complex

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.032336
SO_x	0.000530
NO_x	0.206211
CO	0.300987
PM 10	0.071248

Pollutant	Total Emissions (TONs)
PM 2.5	0.008226
Pb	0.000000
NH_3	0.000280
CO_2e	55.7

14.1 Demolition Phase

14.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

14.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 7500
Height of Building to be demolished (ft): 40

- Default Settings Used: Yes

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

- Construction Exhaust (default)

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

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

14.1.3 Demolition Phase Emission Factor(s)

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

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0382	0.0006	0.2766	0.3728	0.0127	0.0127	0.0034	58.549
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

14.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

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

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

- Construction Exhaust Emissions per Phase

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

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

EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

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

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

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

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

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

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

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

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

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Bldg 1174 Refueling Pump Station

- Activity Description:
Demolition of building to make space for construction of De-icer Complex

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
  Start Month: 5
  Start Month: 2023

- Activity End Date
  Indefinite: False
  End Month: 7
  End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.032336
SO_x	0.000530
NO_x	0.206211
CO	0.300987
PM 10	0.071248

Pollutant	Total Emissions (TONs)
PM 2.5	0.008226
Pb	0.000000
NH_3	0.000280
CO_2e	55.7

15.1 Demolition Phase

15.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
  Start Month: 5
  Start Quarter: 1
  Start Year: 2023

- Phase Duration
  Number of Month: 3
  Number of Days: 0

15.1.2 Demolition Phase Assumptions

- General Demolition Information
  Area of Building to be demolished (ft^2): 7500
  Height of Building to be demolished (ft): 40

- Default Settings Used: Yes

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

15.1.3 Demolition Phase Emission Factor(s)

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

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0382	0.0006	0.2766	0.3728	0.0127	0.0127	0.0034	58.549
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

15.1.4 Demolition Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Exterior renovation of Bldg 1168 Maintenance

- Activity Description:
Addition of space for NDI and corrosion control

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.130764
SO_x	0.000620
NO_x	0.182807
CO	0.274194
PM 10	0.006153

Pollutant	Total Emissions (TONs)
PM 2.5	0.006115
Pb	0.000000
NH_3	0.000388
CO_2e	66.1

16.1 Building Construction Phase

16.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

16.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 8500
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

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

- Vendor Trips Vehicle Mixture (%)

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

16.1.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

16.1.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

16.2 Architectural Coatings Phase

16.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration

Number of Month: 3
Number of Days: 0

16.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 8500
Number of Units: N/A

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

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

- Worker Trips Vehicle Mixture (%)

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

16.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

16.2.4 Architectural Coatings Phase Formula(s)

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

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

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

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

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

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

17. Construction / Demolition

17.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Exterior renovation of Bldg 1171 Fuel Cell Hangar

- Activity Description:
Addition of administration area to accommodate +7 personnel and space to prevent cross-contamination of dirty/clean areas

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.048139
SO_x	0.000600
NO_x	0.168293
CO	0.265024
PM 10	0.005863

Pollutant	Total Emissions (TONs)
PM 2.5	0.005850
Pb	0.000000
NH_3	0.000218
CO_2e	59.4

17.1 Building Construction Phase

17.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

17.1.2 Building Construction Phase Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 1450
Height of Building (ft): 40
Number of Units: N/A

- Building Construction Default Settings

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

- Construction Exhaust (default)

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

- Vehicle Exhaust

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

- Vehicle Exhaust Vehicle Mixture (%)

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

- Worker Trips

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

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

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

- Vendor Trips Vehicle Mixture (%)

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

17.1.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951

LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

17.1.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

17.2 Architectural Coatings Phase

17.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

17.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 1450
Number of Units: N/A

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

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

- Worker Trips Vehicle Mixture (%)

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

17.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171

HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

17.2.4 Architectural Coatings Phase Formula(s)

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

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

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

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

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

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

18. Construction / Demolition

18.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Exterior renovation of Bldg 1172 AGE Warm Storage

- Activity Description:
Addition of space to accommodate additional AGE requiring warm storage

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.086018
SO_x	0.000609
NO_x	0.174918
CO	0.268282
PM 10	0.005995

Pollutant	Total Emissions (TONs)
PM 2.5	0.005971
Pb	0.000000
NH_3	0.000292
CO_2e	62.4

18.1 Building Construction Phase

18.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

18.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 4686
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

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

- Vendor Trips Vehicle Mixture (%)

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

18.1.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

18.1.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

18.2 Architectural Coatings Phase

18.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 3
Number of Days: 0

18.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 4686
Number of Units: N/A

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

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

- Worker Trips Vehicle Mixture (%)

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

18.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

18.2.4 Architectural Coatings Phase Formula(s)

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

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

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

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

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

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

19. Construction / Demolition

19.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Exterior renovation of Bldg 3129 Squad Ops

- Activity Description:
Addition of operational workspace to accommodate incoming personnel (+53 seats)

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.209127
SO_x	0.000639
NO_x	0.196473
CO	0.279644
PM 10	0.006424

Pollutant	Total Emissions (TONs)
PM 2.5	0.006363
Pb	0.000000
NH_3	0.000533
CO_2e	72.2

19.1 Building Construction Phase

19.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

19.1.2 Building Construction Phase Assumptions

- General Building Construction Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Building Category: Office or Industrial
Area of Building (ft^2): 15200
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

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

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

- Vendor Trips Vehicle Mixture (%)

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

19.1.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171

HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

19.1.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

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

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

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

19.2 Architectural Coatings Phase

19.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

19.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 15200
Number of Units: N/A

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

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

- Worker Trips Vehicle Mixture (%)

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

19.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679

LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

19.2.4 Architectural Coatings Phase Formula(s)

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

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

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

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

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

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

20. Construction / Demolition

20.1 General Information & Timeline Assumptions

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Exterior renovation of Bldg 3229 Fuel/Fire Vehicle Maintenance

- Activity Description:
Alteration for the fuel and fire systems maintenance facility; accommodate +6 vehicles and +3 personnel

- Activity Start Date
Start Month: 5
Start Month: 2023

- Activity End Date
Indefinite: False

End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.110745
SO_x	0.000615
NO_x	0.179231
CO	0.270036
PM 10	0.006080

Pollutant	Total Emissions (TONs)
PM 2.5	0.006049
Pb	0.000000
NH_3	0.000337
CO_2e	64.3

20.1 Building Construction Phase

20.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

20.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 6800
Height of Building (ft): 40
Number of Units: N/A

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

- Construction Exhaust (default)

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

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

- Vehicle Exhaust Vehicle Mixture (%)

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

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

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	50.00	50.00	0	0	0	0	0

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

- Vendor Trips Vehicle Mixture (%)

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

20.1.3 Building Construction Phase Emission Factor(s)

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

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

20.1.4 Building Construction Phase Formula(s)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

20.2 Architectural Coatings Phase

20.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 3

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Days: 0

20.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 6800
Number of Units: N/A

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

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

- Worker Trips Vehicle Mixture (%)

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

20.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.240	000.001	000.149	004.757	000.005	000.004		000.024	00313.951
LDGT	000.255	000.002	000.244	005.281	000.007	000.006		000.026	00404.171
HDGV	000.784	000.003	000.892	018.531	000.026	000.023		000.052	00890.679
LDDV	000.113	000.001	000.099	002.967	000.002	000.002		000.008	00321.153
LDDT	000.151	000.001	000.231	002.430	000.004	000.003		000.008	00362.128
HDDV	000.159	000.004	002.909	001.621	000.058	000.053		000.033	01327.398
MC	001.817	000.001	000.707	013.243	000.017	000.015		000.053	00390.634

20.2.4 Architectural Coatings Phase Formula(s)

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

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

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

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

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

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

21. Aircraft

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Fairbanks North Star Borough
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 4 additional KC-135 Beddown (Close Pattern)

- Activity Description:
An increase in the number of KC-135s stationed at Eielson AFB

- Activity Start Date
Start Month: 10
Start Year: 2023

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	4.611938
SO_x	3.065077
NO_x	16.614436
CO	22.630008
PM 10	2.664039

Pollutant	Emissions Per Year (TONs)
PM 2.5	2.397635
Pb	0.000000
NH_3	0.000000
CO_2e	9264.0

- Activity Emissions [Test Cell part]:

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

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

21.2 Aircraft & Engines

21.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: KC-135
Engine Model: J57-P-22

Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

21.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	952.00	88.55	1.07	2.20	79.00	0.16	0.14	3234
Approach	3333.00	1.61	1.07	5.80	7.90	0.93	0.84	3234
Intermediate	6508.00	0.23	1.07	9.50	2.40	1.92	1.73	3234
Military	7460.00	0.12	1.07	11.00	1.90	1.72	1.55	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

21.3 Flight Operations

21.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 4
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 2920
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi [Idle] (mins): 0
Approach [Approach] (mins): 8.83
Climb Out [Intermediate] (mins): 0
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0

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

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

21.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year
$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

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APPENDIX C
WETLANDS DELINEATION REPORT

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Preliminary Jurisdictional Determination Report including Technical Amendment

Eielson Air Force Base KC-135 Redistribution Project

September 9, 2022

Prepared for:

Brice Engineering
3700 Centerpoint West, Suite 8223
Anchorage, AK 99503

Prepared by:

Stantec Consulting Services, Inc.
725 East Fireweed Lane Suite 200
Anchorage, Alaska 99503

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Executive Summary

This 2022 Preliminary Jurisdictional Determination Report presents the findings of the baseline (current existing conditions) extent of wetlands and waters within the KC-135 Redistribution Project study area for Brice Engineering.

The 2022 study area wetland mapping is based on the criteria in the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (USACE 2007), and the 2020 National Wetland Plant List (USACE 2020).

The results of the field verified mapping shows wetlands account for 0.41 acres of the study area (0.2 percent), and waters account for 7.69 acres (3.9 percent) of the study area.

Project Study Area: Waters of the U.S. Determination

Status	Acres	Percent of Study Area
Wetlands	0.41	0.2
Waters	7.69	3.9
Upland (Non-wetlands)	190.52	95.9
Total Study Area	**198.62**	**100.0**

One wetland was found in the study area, classified in the Cowardin system (Cowardin et al. 1979) as Emergent Wetland, and one pond was found in the study area, classified in the Cowardin system as Freshwater Pond.

Abbreviations

2007 Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)
APT	Antecedent Precipitation Tool
FVP	Field Verification Point
GPS	Global Positioning System
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
Stantec	Stantec Consulting Services Inc.
study area	KC-135 Redistribution Project study area
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WB	Waterbody Point
WD	Wetland Determination Point
WOUS	Waters of the U.S.

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has determined the baseline status of the 198.62-acre KC-135 Redistribution Project study area (study area) for Brice Engineering. Stantec conducted field work to determine the extent of wetlands and waters. The study area is located within Eielson Air Force Base, Alaska.

This Preliminary Jurisdictional Determination Report provides the baseline data necessary to determine the total Waters of the U.S. (WOUS) within the study area.

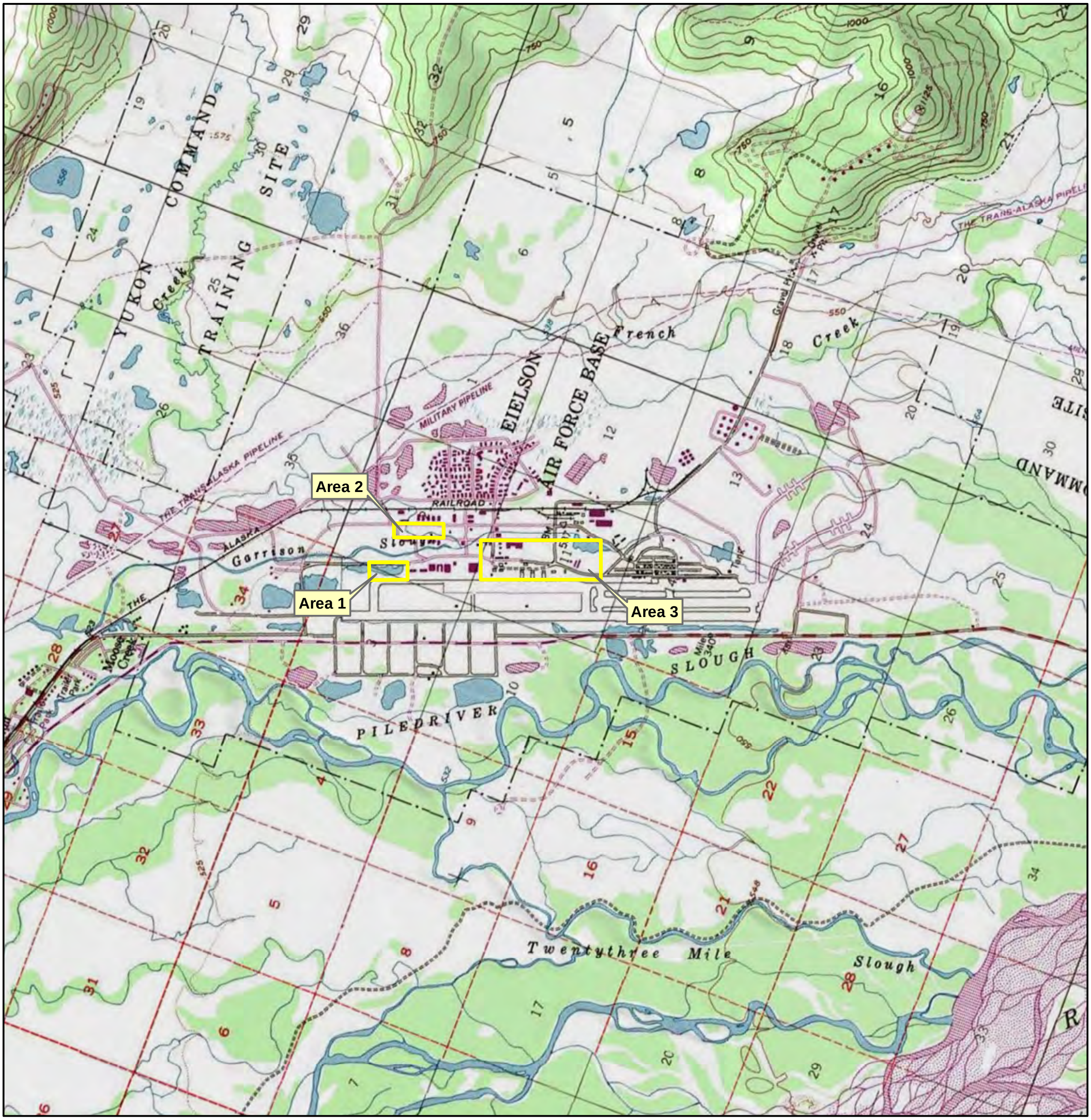
The field team collected field data including wetland determinations in September 2021 and August 2022. The results were mapped in accordance with the U.S. Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) (2007 Supplement; USACE 2007). This Report also meets the guidelines set forth in Special Public Notice 2020-00399 (USACE 2020), Consultant Supplied Jurisdictional Determination Reports.

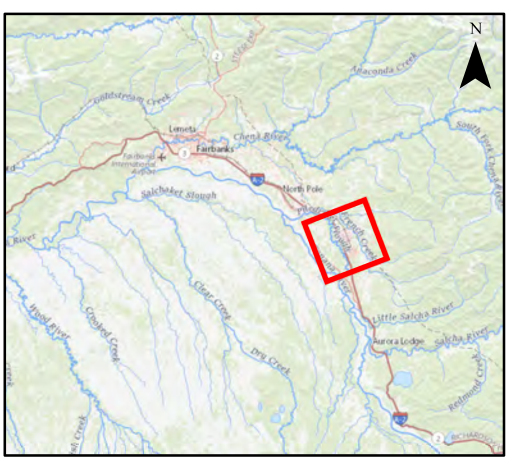
1.1 STUDY AREA LOCATION

The study area is located within the urban environments of Eielson Air Force Base, Alaska. The study area is made up of three components (Figure 1) in the Fairbanks C-1 NE United States Geological Survey (USGS) quadrangle, in the Fairbanks Meridian, and is in 3 Public Land Survey System sections: Township 3S, 3E, Sections 2, 3, and 11 (Table 1).

Table 1 Study Area Location

Area	Meridian	Township	Range	Sections	Centroid Latitude (DD)	Centroid Longitude (DD)	Acres
1	Fairbanks	3S	3E	2,3	64.6837	-147.1066	21.63
2	Fairbanks			2	64.6823	-147.0949	22.63
3	Fairbanks			11	64.6695	-147.0911	154.36





Study Area

0 0.5 1 Miles

(At original document size of 8.5x11)
1:63,360 1 in = 1 miles

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Project Location

Figure Number

1

Stantec

2.0 EXISTING DATA AND METHODOLOGY

2.1 EXISTING DATA

Sources of existing data used in developing baseline environmental data include: U.S. Department of Agriculture (USDA) ecoregion and soil survey information, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory wetland mapping, USGS project watersheds and stream data, and local climate data.

2.1.1 National Wetlands Inventory

The National Wetlands Inventory (NWI) on-line Wetlands Mapper (USFWS 2022a) shows the study area is covered by digital NWI data. Fairbanks area NWI mapping was most recently updated using 1997 Color Infrared aerial photography. Mapping was conducted at a scale of 1:30,000.

The NWI shows a Freshwater Pond in Area 1 of the study area. A Freshwater Pond is shown in the northeast corner of Area 3, with two Riverine (stream) components. A Freshwater Emergent Wetland is shown in the southern portion of Area 3 (Figure 2).

2.1.2 National Hydrography Dataset

The study area is within the Moose Creek – Tanana River USGS Hydrologic Unit Code 10 watershed (1908030710) (USGS 2022).

One National Hydrography Dataset-mapped stream flows through the study area in the same location as the NWI-mapped Riverine waters (USGS 2022).

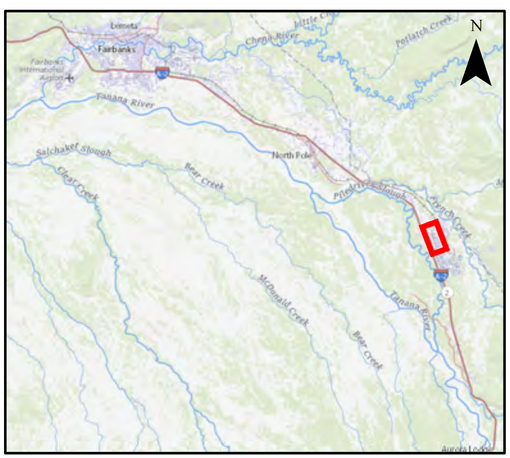
2.1.3 Soil Surveys

The Soil Survey of Fort Wainwright Area, Alaska (USDA 2006) covers the study area.

The study area falls within three map units (Table 2 and Figure 3). The table lists the potential hydric components for each of the map units.

Table 2 Soil Survey Units within the Study Area

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area	Percent Hydric Components
363	Jarvis-Salchaket complex	28.81	14.5	7
UC	Urban land-Typic Cryorthents complex, 0 to 2 percent slopes	163.05	82.1	0
W	Water	6.75	3.4	N/A
	Total	**198.62**	**100.0**	



Study Area

NHD Flowline

NWI Type

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Riverine

0 600 1,200 Feet

(At original document size of 8.5x11)

1:11,000 1 in = 916.67 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

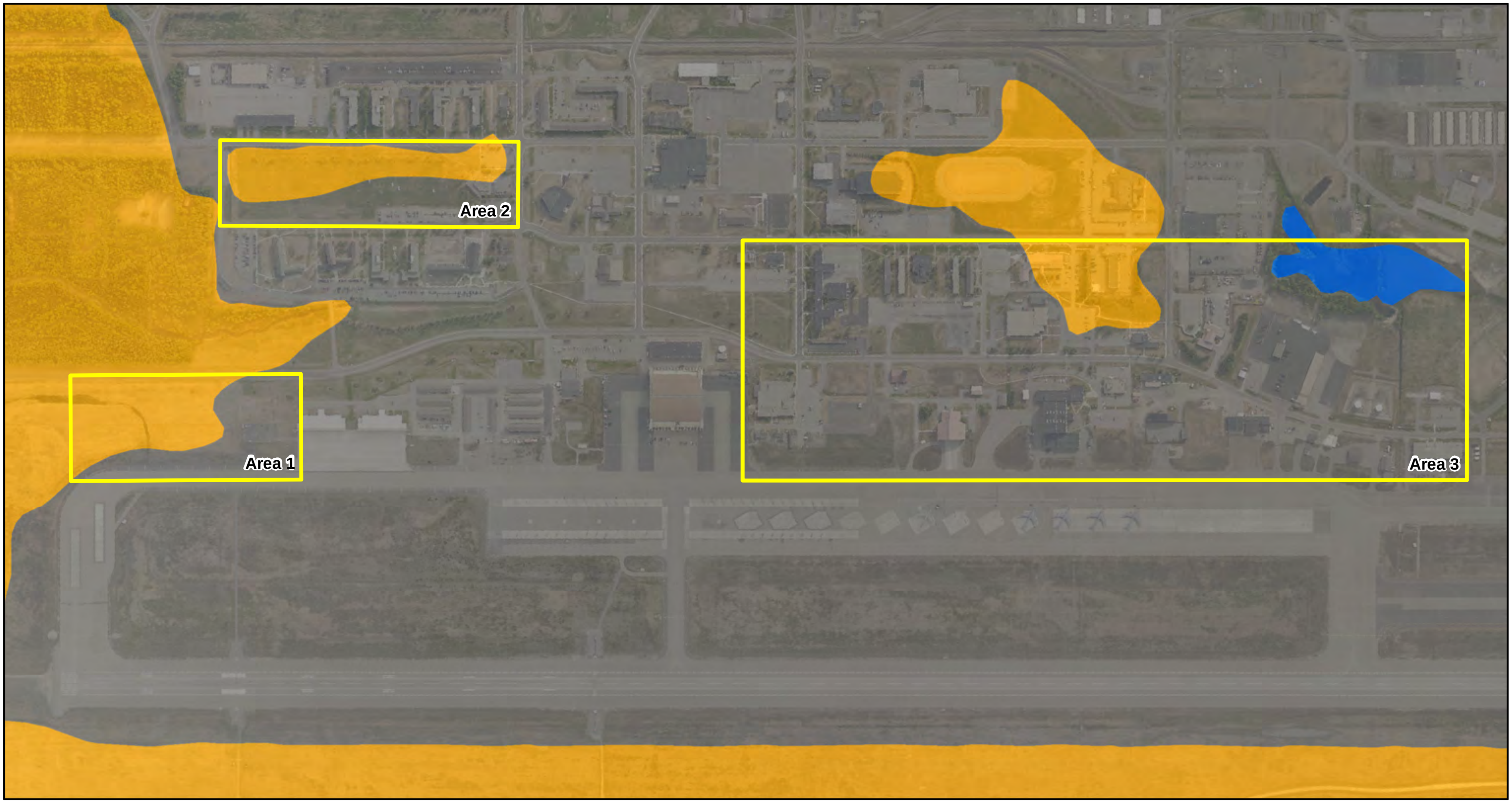
Figure

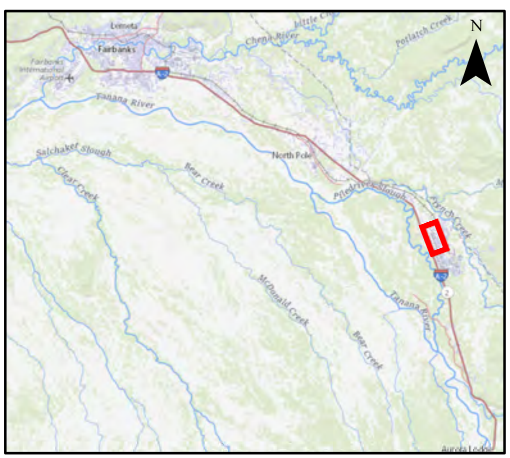
NWI and NHD Mapping

Figure Number

2

Stantec





Study Area

Soil Map Unit

Jarvis-Salchaket complex

Urban land-Typic Cryorthents complex, 0 to 2 percent slopes

Water

0 600 1,200 Feet

(At original document size of 8.5x11)

1:11,000 1 in = 916.67 feet

Client

Brice Engineering

Project

KC-135 Redistribution Project

Figure

Soil Mapping

Figure Number

3

Stantec

2.1.4 Climate Data

The growing season for this area begins on May 3 and ends on October 3 (USACE 2007).

Precipitation data leading to 2021 field work is listed in Table 3. The weather conditions preceding the field investigations were considered during onsite determinations. Normal precipitation is based on 1981-2010 records for North Pole, Alaska (National Oceanic and Atmospheric Administration 2022). Field work was conducted September 22, 2021. Precipitation for the water year, starting October 2020, was 62 percent of normal (Table 3). These data suggest that conditions during field work were normal to drier than normal.

Table 3 2021 Water Year WETS Precipitation for North Pole, Alaska

Month	Total Monthly Accumulated Precipitation (Inches)	Average Monthly Accumulated Precipitation 1981-2010 (Inches)	Percent of Average Precipitation	30% Chance Precipitation	
				Less Than (In.)	More Than (In.)
October 2020	0.48	0.93	52	0.56	1.12
November 2020	1.05	0.73	144	0.28	0.86
December 2020	0.15	0.70	21	0.27	0.84
January 2021	0.00	0.62	0	0.26	0.74
February 2021	0.97	0.48	202	0.14	0.55
March 2021	0.22	0.30	73	0.08	0.34
April 2021	1.13	0.37	305	0.00	0.28
May 2021	0.59	0.65	91	0.24	0.79
June 2021	1.34	1.57	85	0.97	1.90
July 2021	1.69	1.97	86	1.05	2.41
August 2021	3.74	2.01	186	1.26	2.42
September 2021	0.30	1.10	27	0.65	1.34
Total	**7.07**	**11.42**	**62**	**-**	**-**

Precipitation data leading to 2022 field work is listed in Table 4. The weather conditions preceding the field investigations were considered during onsite determinations. Normal precipitation is based on 1981-2010 records for North Pole, Alaska (National Oceanic and Atmospheric Administration 2022). Field work was conducted August 5, 2022. Precipitation for the water year, starting October 2021, was 156 percent of normal (Table 4). These data suggest that conditions during field work were normal.

Table 4 2022 Water Year WETS Precipitation for North Pole, Alaska

Month	Total Monthly Accumulated Precipitation (Inches)	Average Monthly Accumulated Precipitation 1981-2010 (Inches)	Percent of Average Precipitation	30% Chance Precipitation	
				Less Than (In.)	More Than (In.)
October 2021	1.99	0.93	214	0.56	1.12
November 2021	0.41	0.73	56	0.28	0.86
December 2021	5.22	0.70	746	0.27	0.84
January 2022	0.15	0.62	24	0.26	0.74
February 2022	1.12	0.48	233	0.14	0.55
March 2022	0.10	0.30	33	0.08	0.34
April 2022	MT	0.37	0	0.00	0.28
May 2022	0.93	0.65	143	0.24	0.79
June 2022	1.63	1.57	104	0.97	1.90
July 2022	M1.41	1.97	72	1.05	2.41
Total	**12.96**	**8.32**	**156**	**-**	**-**

The Antecedent Precipitation Tool (APT, EPA 2022) was also run for the study area and returned a value of Normal Conditions for September 22, 2021, and a value of Normal Conditions for August 5, 2022. The APT output is shown in Appendix A.

2.1.5 Threatened and Endangered Species

There are no threatened or endangered State or Federally listed species within the general area around the study area (USFWS 2022b).

2.2 METHODOLOGY

This section provides the methodology used during field data collection and digital mapping.

2.2.1 Field Data Collection

During the 2021 and 2022 wetland field evaluations, Global Positioning System (GPS) locations and detailed information on plots (1/10) were recorded in representative project vegetation types. Additional field data, notes, and photographs were used to evaluate mapping areas with similar characteristics.

Field data was collected and recorded using three types of plots:

Wetland Determination (WD) Plots. At these sites, investigators recorded detailed descriptions of vegetation, hydrology, and soils on field data forms. Wetland status for this plot type was determined based on the presence or absence of hydrophytic vegetation, hydrology, and hydric soils (USACE 2007).

Field Verification Points (FVP). Photographs and GPS locations were taken for vegetation communities and landscape positions that were clearly wetland, water, or upland. If a wetland or water, Hydrogeomorphic (HGM) and Cowardin classifications were recorded.

Stream Crossing (SC) Points. Photographs and GPS locations were taken when streams were encountered. Cowardin classifications were recorded.

Waterbody (WB) Points. Photographs and GPS locations were taken when ponds and lakes were encountered. Cowardin classifications were recorded.

Plant Data

Alaska is divided into subregions, where plant indicator statuses may differ from the rest of the State. The study area is within the National Wetland Plant List subregion Interior Alaska Lowlands. None of the six plants with indicator status changes were found on site. Plant indicator statuses are described in Appendix B. Plants were identified to the taxonomic level of species.

The presence of hydrophytic vegetation was determined using the prevalence index and the dominance test (USACE 2007).

Hydric Soils Assessment

Field indicators of hydric soils and determination of hydric soil status was based on USDA National Resource Conservation Service (NRCS) guidance (USDA 2018) and the 2007 Supplement (USACE 2007). The 2007 Supplement contains a subset of hydric soil indicators found in the U.S. as determined by the National Technical Committee for Hydric Soils (USACE 2007). Additional soil characteristics recorded within the soil horizons were based on NRCS guidance (Schoeneberger et al. 2012).

Hydrology

The 2007 Supplement lists numerous primary and secondary hydrology indicators. All indicators found in each sampling area were recorded in the data form.

Field Data

Field data were collected at 20 sites throughout the study area. All field data were entered into a project database where the data were reviewed; queries were generated from the database to provide the information needed for mapping and results analyses.

Field data was collected September 22, 2021, and August 4, 2022, by Professional Wetland Scientist Steve Reidsma. Twelve plots were collected in 2021, and eight in 2022. Field plot types collected are shown in Table 5. Each field plot with photos is presented in Appendix C.

Table 5 Field Data Contributing to this Project

Field Plot Type	Wetlands and Waters	Uplands	Total Plots
Wetland Determination (WD)	0	1	1
Field Verification Point (FVP)	2	14	16
Stream Crossing (SC)	1	0	1
Waterbody (WB)	2	0	2
Total	**5**	**15**	**20**

2.2.2 Wetland Mapping

Final mapping (waters boundaries, Cowardin classification) was completed using 2-foot contour data and several years of aerial imagery collected by the Fairbanks North Star Borough (2012, 2017, and 2020) in ESRI's ArcMap GIS (10.8) environment.

Field data were used to identify the characteristics of wetlands or waters at a specific location. In addition to imagery interpretations, ancillary data including field notes, general landscape position, slope, and aspect were utilized in the mapping process.

Mapping polygons were drawn to delineate differences among the classification systems used to attribute wetlands and waters polygons. Delineation occurred at a scale of 1:600 (one-inch equals 50 feet).

3.0 RESULTS

3.1 WETLANDS AND WATERS

The field verified wetlands and waters totals are summarized in Table 6. Figure 4 shows the wetlands and waters in the study area.

Table 6 Waters Within the Study Area

Status	Acres	Percent of Study Area
Wetlands	0.41	0.2
Waters	7.69	3.9
Uplands	190.52	95.9
Total Study Area	**198.62**	**100.0**

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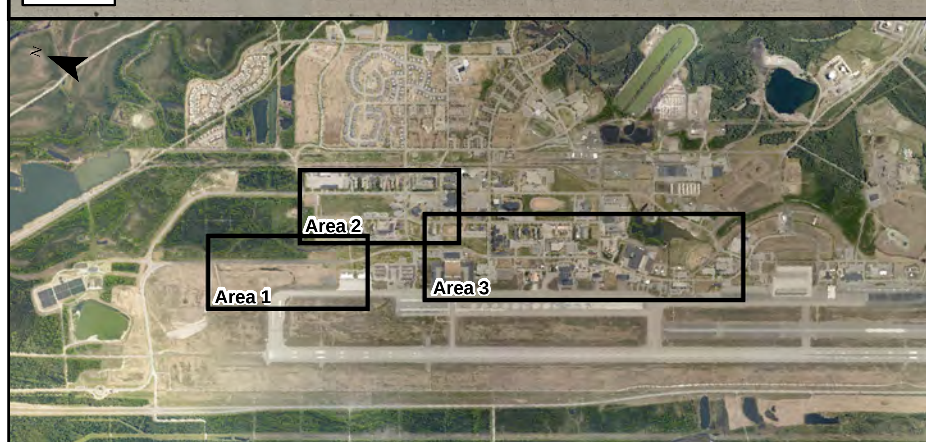

Field Plot Type

- Wetland
- Pond
- Stream
- Upland

- Study Area
- Existing Structure (Labeled by Building ID)
- Waterbody
- Wetland

Coordinate System: WGS 1984 UTM Zone 6N
Projection: Transverse Mercator
Datum: WGS 1984
Imagery: Fairbanks North Star Borough 2017

0 200 400 800 Feet

1:4,800 1 inch equals 400 feet

N E S W

Eielson Air Force Base
KC-135 Redistribution

Waters of the U.S. Delineation

Figure 4 | 8/24/22

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A freshwater pond connected to Garrison Slough was delineated in the study area. A full wetland delineation (ST09) showed that the vegetated areas adjacent to the pond do not qualify as wetlands. The pond is an excavated feature with an abrupt upland and waters edge and was classified under the NWI system as PUBHx. The total acreage of the pond within the study area is 7.69 acres. A linear feature connected to the pond extends to the southwest towards the tarmac. A photograph of the pond is shown in Figure 5.

Figure 5 Pond

Depressions in the southeastern portion of the study area near the aircraft parking aprons were reviewed, including the area identified by the NWI as an excavated freshwater emergent wetland. These depressions were found to be water runoff collection basins and snow dumps. There was no evidence of dominant hydrophytic vegetation or wetland hydrology in these depressions (e.g., sediment deposits, water marks), and they appeared to be terminal and had no direct surface connection to WOUS nor each other. Current Environmental Protection Agency guidance was reviewed to determine if these features meet the pre-2015 regulatory definition of WOUS. The depressions are manmade features that do not qualify as WOUS under 40 CFR 230.3(s)(1-7). Photos from several of these features are shown in Figure 6.

Figure 6 Depression Features

A drainage ditch was reviewed in the southwest corner of the study area in an areas identified by the NWI as a freshwater emergent wetland. The ditch is an excavated linear feature that contains surface water and is dominated by Obligate wetland vegetation, which qualifies it as a wetland. A photograph of the feature is shown in Figure 7.

Figure 7 Wetland Ditch

3.1.1 Cowardin Classification

As part of the wetlands mapping, vegetation communities were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

Table 7 shows all waters in the study area are classified in the Cowardin system as Freshwater Pond, covering 7.69 acres of the study area, and all wetlands in the study area are classified as Emergent, covering 0.41 acres of the study area.

Table 7 Cowardin Classifications for the Study Area

Cowardin Type	NWI Code	Waters Acres	Percent of Study Area	Percent of Wetlands and Waters
Wetlands				
Emergent Wetland	PEM1	0.41	0.2	5.1
Total Wetlands		**0.41**	**0.2**	**5.1**
Waters				
Freshwater Pond	PUB	7.69	3.9	94.9
Total Waters		**7.69**	**3.9**	**94.9**
Total Wetlands and Waters		**8.10**	**4.1**	**100.0**
Total Uplands		190.52	95.9	
Total Study Area		**198.62**	**100.0**	

3.1.2 Tributaries

The delineated pond is an excavation of Garrison Slough and has perennial inlet and outlet to the slough. The wetland occurs in a concave drainage feature that has connection to Garrison Slough, confirmed by field data points ST19 and ST20. Garrison Slough is a tributary to Moose Creek, which flows into Piledriver Slough, which flows into the Tanana River, a Traditional Navigable Water.

3.2 VEGETATION

The study area is part of the urban environment of Eielson Air Force Base and has been historically cleared, filled, and built. Non-paved areas are primarily characterized by mowed vegetation, landscaped trees or shrubs, or in some cases disturbance regrowth. The pond in the northeast was created by gravel mining; forested areas around the edge are disturbance regrowth. The wetland in the southeast occurs in an excavated linear depression; its dominant vegetation species is a sedge, *Carex aquatilis* (Leafy Tussock Sedge).

Plant Species

Eleven vascular plant species are included in the project plant list (Appendix B) and represent the species recorded at the WD plot (ST09), which was in a regrowth forest dominated by Balsam Poplar, and the Leafy Tussock Sedge observed at ST18.

None of the species recorded in the study area are considered threatened or endangered (USFWS 2022b). Only one plant species is endangered in Alaska, *Polystichum aleuticum*, a small fern endemic to the Aleutian Islands, and is not expected to occur in the study area.

4.0 REFERENCES

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APPENDICES

Appendix A ANTECEDENT PRECIPITATION TOOL

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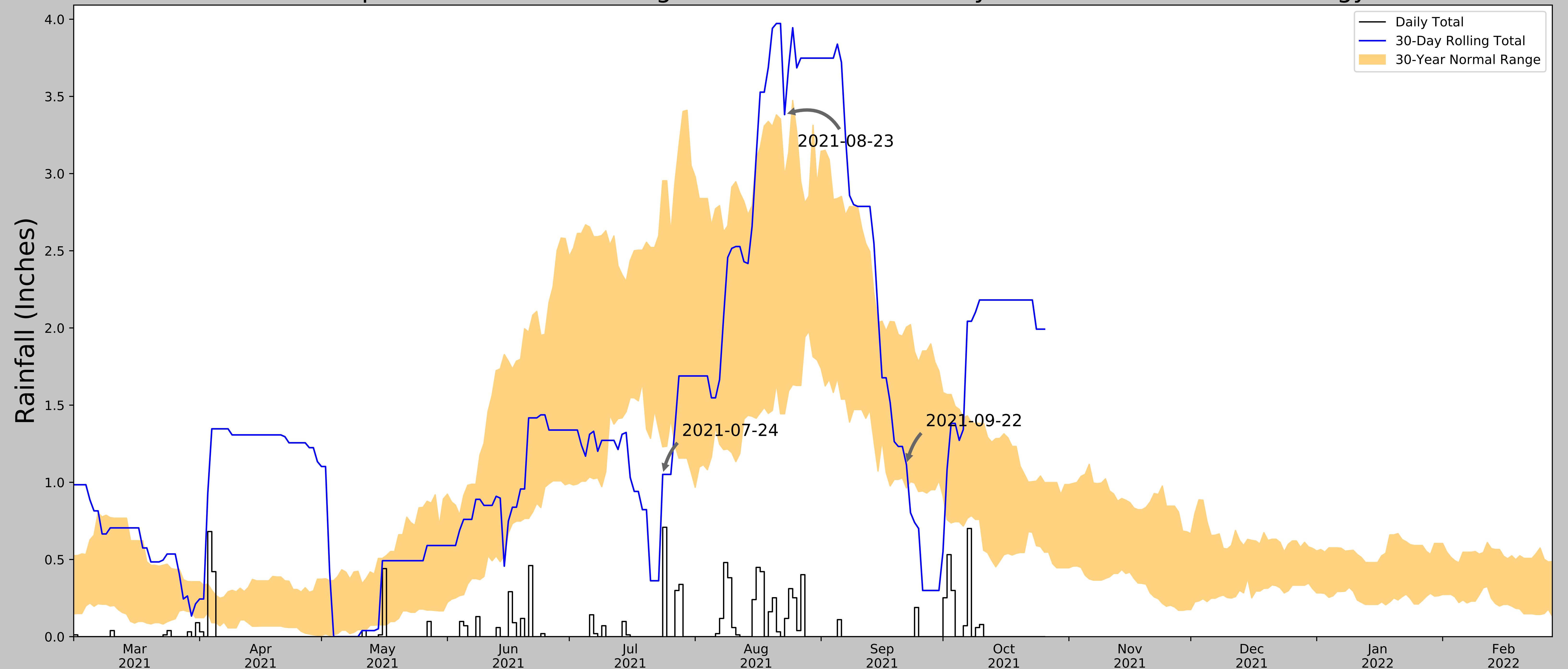
Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	64.67, -147.09
Observation Date	2021-09-22
Elevation (ft)	540.73
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

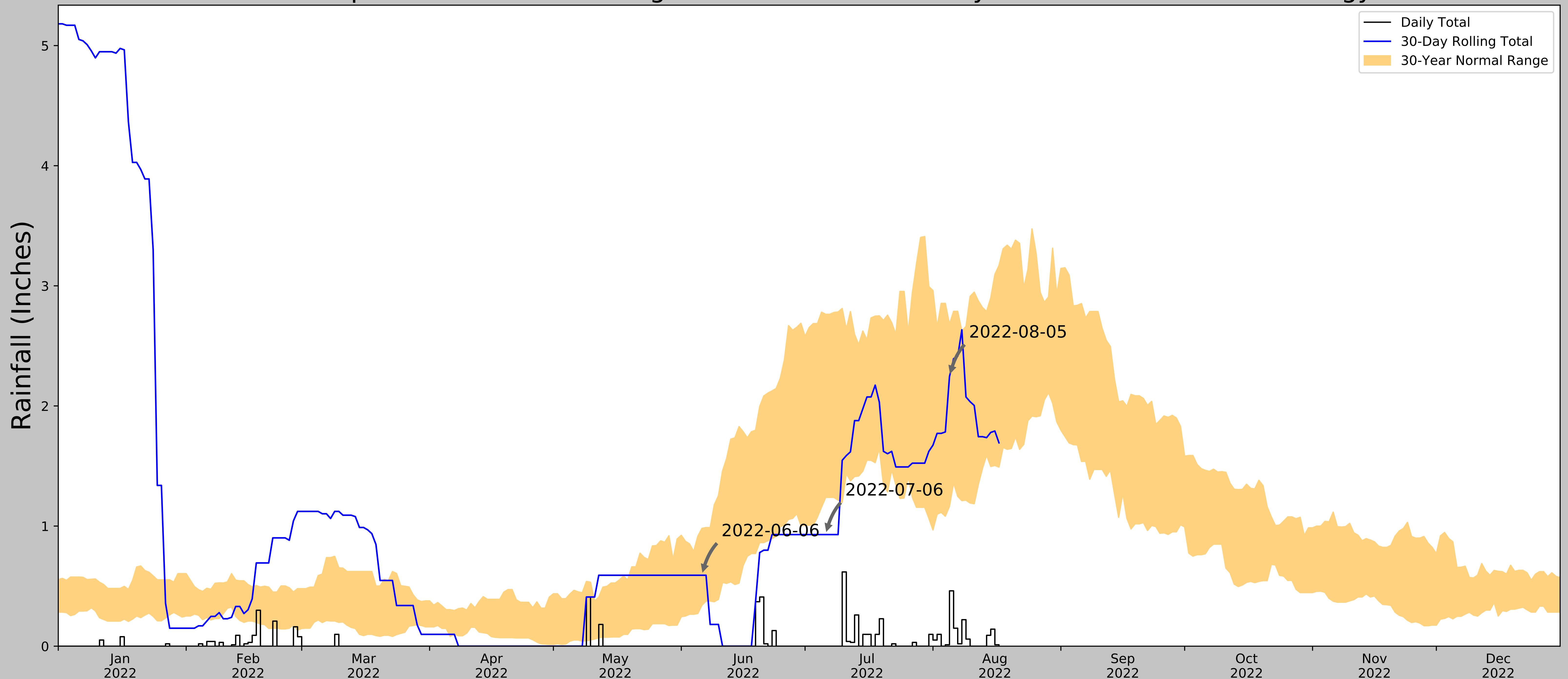
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-22	0.962992	2.005118	1.114173	Normal	2	3	6
2021-08-23	1.444095	2.981496	3.38189	Wet	3	2	6
2021-07-24	1.229921	2.953543	1.051181	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
N POLE	64.7581, -147.3253	475.066	9.234	65.664	4.762	11156	89
N POLE 1N	64.76, -147.34	496.063	0.453	20.997	0.213	78	1
MOOSE CREEK	64.7136, -147.1581	517.06	5.811	41.994	2.859	1	0
EIELSON FLD	64.6667, -147.1	546.916	9.17	71.85	4.785	68	0
AURORA	64.8553, -147.7217	442.913	13.455	32.153	6.487	43	0
Fairbanks F.O.	64.85, -147.8	450.131	15.339	24.935	7.285	7	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	64.67, -147.09
Observation Date	2022-08-05
Elevation (ft)	540.73
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-08-05	1.164173	2.680315	2.244095	Normal	2	3	6
2022-07-06	1.238583	2.762992	0.929134	Dry	1	2	2
2022-06-06	0.340945	0.980709	0.590551	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
N POLE	64.7581, -147.3253	475.066	9.234	65.664	4.762	11152	90
N POLE 1N	64.76, -147.34	496.063	0.453	20.997	0.213	83	0
MOOSE CREEK	64.7136, -147.1581	517.06	5.811	41.994	2.859	1	0
EIELSON FLD	64.6667, -147.1	546.916	9.17	71.85	4.785	67	0
AURORA	64.8553, -147.7217	442.913	13.455	32.153	6.487	43	0
Fairbanks F.O.	64.85, -147.8	450.131	15.339	24.935	7.285	7	0

Appendix B PLANT LIST

Project study area plants recorded during Stantec field work in 2021.

Latin Name	Common Name[a]	Indicator Status Rating[a]
Tree		
Populus balsamifera	Balsam Poplar	FACU
Shrub/Sapling		
Arctostaphylos uva-ursi	Red Bearberry	UPL
Populus balsamifera	Balsam Poplar	FACU
Populus tremuloides	Quaking Aspen	FACU
Rosa acicularis	Prickly Rose	FACU
Salix bebbiana	Gray Willow	FAC
Shepherdia canadensis	Russet Buffalo-Berry	FACU
Herbaceous		
Calamagrostis canadensis	Bluejoint	FAC
Carex aquatilis	Leafy Tussock Sedge	OBL
Chamaenerion angustifolium	Narrow-Leaf Fireweed	FACU
Equisetum arvense	Field Horsetail	FAC
Orthilia secunda	Sidebells	FACU

Appendix C FIELD DATA FORMS AND PHOTOS

PHOTO REPORT

Plot Number	ST01
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.672739
Longitude (DD)	-147.097385

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST02
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671872
Longitude (DD)	-147.094117

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST03
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.669064
Longitude (DD)	-147.094253

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST04
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.668577
Longitude (DD)	-147.093675

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST05
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.670454
Longitude (DD)	-147.096018

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST06
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671704
Longitude (DD)	-147.097127

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST07
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671145
Longitude (DD)	-147.09615

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: NE

PHOTO REPORT

Plot Number	ST08
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.671139
Longitude (DD)	-147.095059

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Alaska Region

Plot No: ST 09

Project:	Date: 9/22/21
Applicant: Brick	Investigators: SRC
Borough/City/Location: FAFB	

NAD 83, Decimal Degrees

STANTEC

Latitude: 64.66716	Watershed: HUC12 Garrison Slough-Moose Creek
Longitude: -147.085820	Location Notes:
Elevation (ft): 533	mounds of gravel nearby

SUMMARY OF FINDINGS

Are "Normal Circumstances" Present?			YES	Hydrophytic Vegetation Present?	NO
Significantly Disturbed?	VEG	SOILS	HYDRO	Hydric Soils Present?	NO
Naturally Problematic?	VEG	SOILS	HYDRO	Wetland Hydrology Present?	NO
Remarks:				**Is the Sampled Area within a Wetland?**	NO

VEGETATION T< 1%, P = Present **SUBREGION:**

Tree Stratum DBH ≥ 3 inch — 1/10 acre circular plot unless noted, absolute cover recorded

Species	IND	DOM	Cover	Species	IND	DOM	Cover
1. POPBAL	FU	Y	25	3.			
2.				4.			
Total Tree Cover: 25		**50% of Total Cover:** 12.5			**20% of Total Cover:** 5		
Sapling/Shrub Stratum	**IND**	**DOM**	**Cover**	8.			
1. POPBAL	FU	Y	35	9.			
2. ROSACI	FU	Y	20	10.			
3. POPTRE	FU	N	15	11.			
4. ~~VACUIT~~				12.			
5. ARC UVAURSI	UP	N	5	13.			
6. SAL BEB	F	N	3	14.			
7. SHECAN	FU	N	T	15.			
Total Shrub Cover: 78		**50% of Total Cover:** 39			**20% of Total Cover:** 15.6		
Herbaceous Stratum	**IND**	**DOM**	**Cover**	13.			
1. CHAANG	FU	Y	3	14.			
2. EQUARV	F	N	T	15.			
3. CALCAN	F	Y	5	16.			
4. ORTSEC	FU	N	T	17.			
5.				18.			
6.				19.			
7.				20.			
8.				21.			
9.				22.			
10.				23.			
11.				24.			
12.				25.			
Total Herb Cover: 8		**50% of Total Cover:** 4			**20% of Total Cover:** 1.6		
1.Open Water				2. Bare ground			

Remarks: Bryophytes and Lichens may be listed in the Herbaceous columns

Soil: S NE

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:
OBL species	–	x 1 =
FACW species	–	x 2 =
FAC species	8	x 3 = 24
FACU species	98	x 4 = 392
UPL species	5	x 5 = 25
Column Totals:	111 (A)	441 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

N Dominance Test is >50%

N Prevalence Index is ≤3.0

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1]

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Project Vegetation Type

CDF

Cowardin Code: U

HGM Classification: n/a

Landform: lowland-bench

Local Relief: flat

Microtopography: flat | Slope: – | Aspect: 100

SOIL

Plot No: ST 09

Profile Description: Describe to the depth needed to document the presence/absence of soil indicators											Soil Map Unit Name
	Horizon	Soil Matrix		Redox Features							-
Depth (in.)	Name	Color (moist)	%	Type[1]	Color	%	Loc[2]	Mod[3]	Texture	Horizon Comments	
1-0	Oi										
8-18	Bw	10YR 2.5/4	100					GR	SA		

[1]Type: C=Concentrations, D=Depletions, OX=Oxidized Roots, RM = Reduced Matrix [2]Location: PL=Pore Linings, RC=Root Channels, M=Matrix, CS=Coated Sand Grains

Remarks: previously dist., prior gravel pit area

[3]Texture Modifiers: Mucky (MK), Peaty (PT), Permafrost (PF) | Coarse Fragments: Gravelly (GR), Cobbly (CB), Stony (ST) (15-35%), 35-60% = Very (V), 60-90% = Extremely (X)

Hydric Soil Indicators Measure from the top of the mineral soil layer except for A1, A2, A3, A4

N Histosol or Histel (A1)
N Histic Epipedon (A2)[4]
N Black Histic (A3)
N Hydrogen Sulfide (A4)
N Thick Dark Surfaces (A12)
N Alaska Gleyed (A13)
N Alaska Redox (A14)
N Alaska Gleyed Pores (A15)

Hydric Soils Present?	NO
NRCS Drainage Class:	MWD
Depth of Organic Soils:	1
Restrictive Layer Type:	—
Restrictive Layer Depth:	—

[4]Underlain by mineral soil w/chroma of ≤2

Indicators for Problematic Hydric Soils[5] (See Page 91/Section 4 for Problematic Hydric Soils Details)

N Depleted Below Dark Surface (A11)
N Depleted Matrix (F3)
N Redox Dark Surface (F6)
N Depleted Dark Surface (F7)
N Redox Depression (F8)
N Red Parent Material (F21)
N Very Shallow Dark Surface (F22)
N Alaska Color Change (TA4) Give details of color change
N Alaska Alpine Swales (TA5)
N Alaska Redox with 2.5Y Hue
N Alaska Gleyed w/o Hue 5Y or Redder Underlying
N AA Positive (mineral soil, 60% of horizon 4 inches thick)
N Ponded/Flooded/High Water Table (12 inches or higher)
N Low Organic Matter/Low Iron/High pH Soil/New Wetland
___ Other (explain in remarks)

[5]Must have Hydrophytic Vegetation and Primary Hydrology, and an appropriate landscape position unless disturbed or problematic

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (any one indicator is sufficient)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Marl Deposits (B15)
N Hydrogen Sulfide Odor (C1) (w/in 12")
N Dry-Season Water Table (C2)**
N Other (Explain in Remarks)

Are Climatic/Hydrologic Conditions on Site Typical for this time of Year? yes

Secondary Indicators (2 or more required)

N Water-stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres along Living Roots (C3)(w/in 12")
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (w/in 24", note as restrictive layer)
N Microtopographic Relief (D4)
N FAC-Neutral Test (D5)

Field Observations (inches from ground surface)

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____
Episaturation ____ Endosaturation ____

Water Source:

Wetland Hydrology Present? NO

Dry Season Water Table SC, Interior, Western AK:

Mid May – late July
**Mineral Soils 12-24 inches
**Organic Soils 12-40 inches

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FAC-Neutral Test = #OBL+FW dominants > #FU + UPL dominants; add non-dominants if tie

PHOTO REPORT

Plot Number	ST09
Wetland Status	Upland
Plot Type	WD
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.667159
Longitude (DD)	-147.085801

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST10
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021
NWI Classification	PUBHx
Latitude (DD)	64.667137
Longitude (DD)	-147.085484

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST11
Wetland Status	Pond
Plot Type	WB
Plot Date	9/22/2021
NWI Classification	PUBHx
Latitude (DD)	64.665478
Longitude (DD)	-147.085506

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: SE

PHOTO REPORT

Plot Number	ST12
Wetland Status	Upland
Plot Type	FVP
Plot Date	9/22/2021
NWI Classification	U
Latitude (DD)	64.665507
Longitude (DD)	-147.085636

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST13
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/10/2022
NWI Classification	U
Latitude (DD)	64.673489
Longitude (DD)	-147.09808

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST14
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/11/2022
NWI Classification	U
Latitude (DD)	64.681269
Longitude (DD)	-147.094018

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST15
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/12/2022
NWI Classification	U
Latitude (DD)	64.682475
Longitude (DD)	-147.09637

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST16
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/13/2022
NWI Classification	U
Latitude (DD)	64.682401
Longitude (DD)	-147.104931

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST17
Wetland Status	Upland
Plot Type	FVP
Plot Date	8/14/2022
NWI Classification	U
Latitude (DD)	64.683514
Longitude (DD)	-147.106019

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST18
Wetland Status	Wetland
Plot Type	FVP
Plot Date	8/15/2022
NWI Classification	PEM1Cx
Latitude (DD)	64.684428
Longitude (DD)	-147.10702

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST19
Wetland Status	Wetland
Plot Type	FVP
Plot Date	8/16/2022
NWI Classification	PEM1Cx
Latitude (DD)	64.68862
Longitude (DD)	-147.10947

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST20
Wetland Status	Stream
Plot Type	FVP
Plot Date	8/17/2022
NWI Classification	R2UBH
Latitude (DD)	64.688915
Longitude (DD)	-147.108297

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NA

Photo Type: Hydrology Direction: SE

APPENDIX D
SUMMARY OF EIELSON AIR FORCE BASE BIRD AND WILDLIFE STRIKE HAZARD (BASH) PROGRAM RESPONSIBILITIES

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SUMMARY OF EIELSON AIR FORCE BASE BIRD AND WILDLIFE STRIKE HAZARD (BASH) PROGRAM RESPONSIBILITIES

- Coordinate with United States Department of Agriculture (USDA)/Wildlife Services (WS) to determine if bird avoidance dates, normally 15 April – 15 May (spring migration) and 15 August–20 September (fall migration), need to be modified in response to significant changes in the local bird population or migratory activity.
- Engage in constant communication between the USDA/WS and 354 Civil Engineer Squadron (CES)/CEIEA to determine the best solution to any wildlife that may pose a threat to aircraft.
- Maintain applicable USDA Federal Migratory Bird Depredation Permits in accordance with Air Force Instruction (AFI) 91-202, The U.S. Air Force (USAF) Mishap Prevention Program (as supplemented by Pacific Air Force [PACAF]).
- Advise Air Traffic Control or the Supervisor of Flying, if on duty, of bird activity observed on or near the airfield or in the traffic pattern.
- Monitor bird/wildlife population, grass height, and standing water within the Airfield Zone and report problems to the appropriate Office of Primary Responsibility for modifying or eliminating the problem.
- Obtain federal and state permits required for depredation, salvage, collection, and possession of all migratory or local species. Provide guidance and support for biological monitoring of wildlife populations and habitat management to improve technical advice for wildlife and vegetation management programs.
- Limit the minimum altitude to 1,000 feet above ground level when any of the following occur:
  - High daily bird survey numbers
  - Flocking birds observed in Class D airspace
  - Moderately increased levels of birds are observed in the Eielson Air Force Base (AFB) Bird Exclusion Zone
- From approximately April to the end of September, USDA/WS detection and dispersal teams will manage wildlife in accordance with guidance as stated in the USDA/WS Wildlife Hazard Management Protocol (29 April 2019) and the Memorandum of Understanding between the USDA/WS and Eielson AFB.
- Periodic habitat surveys should be conducted in Eielson AFB Exclusion Zones to identify major habitat types available to birds, and update maps based on these surveys as local land uses and habitat conditions change.

REFERENCES

Eielson Air Force Base (AFB). 2021c. *Eielson Air Force Base Bird and Wildlife Strike Hazard (BASH) Program.* May.

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