UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

DRAFT ENVIRONMENTAL ASSESSMENT FOR THE NORTH RUNWAY HILL REMOVAL PROJECT

February 2017

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North Runway Hill Removal Project
Joint Base Elmendorf-Richardson, Alaska
Draft Environmental Assessment

February 2017

Prepared for the U.S. Army Corps of Engineers and the

U.S. Air Force

DRAFT
FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE

NAME OF PROPOSED ACTION

North Runway Hill Removal Project at Joint Base Elmendorf-Richardson (JBER), Alaska.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Joint Base Elmendorf-Richardson is proposing to excavate a portion of the hill that lies to the north of Elmendorf Airfield. During the 2017-2018 construction seasons, excavation would remove about 2,000,000 cubic yards (cy) of materials, reducing the elevation of the hill, and rendering the glide paths for departures and landings at Elmendorf Airfield safe and optimal. This action is intended to eliminate the need for flight waivers by establishing a suitable glide path, or angle of approach, to the north of the north-south runway to ensure U.S. Air Force conformance with the Unified Facilities Criteria (UFC) 3-260-1 and the Federal Aviation Regulations (FAR) Part 77.

North hill excavation began several years ago and disposal of excavated material has been accommodated by existing disposal sites. However, it is projected that 2,000,000 additional cy of earth would need to be removed from the hill, and currently-used disposal sites could only receive about 400,000 cy of that material. The attached Environmental Assessment analyzed the environmental impacts associated with the excavation and disposal of approximately 1,600,000 cy of material. The remaining 400,000 cy would be deposited in existing disposal areas that have remaining capacity.

In order to bring Runway 16/34 into compliance with UFC 3-260-01 and FAR Part 77 and to provide safe aircraft operations, the removal of part of the hill to the north of the runway is necessary. Physical constraints eliminate the option of installing a runway extension to the south, leaving hill removal as the only practical action.

If no action were taken, hill removal activities immediately north of Runway 16/34 would cease at the end of the 2016 construction season and would not resume. Additional waivers of airspace clearance requirements under UFC 3-260-01 and FAR Part 77 would be sought to allow continued use of the runway. This alternative may continue to compromise the safety of crew and aircraft. Safety considerations may also lead the USAF to reduce or eliminate such aircraft operations in the future. Four additional alternatives were considered during the initial planning stages of the EA but were subsequently eliminated from further consideration because they would be too small to handle the volume of earth that needs to be moved, require longer hauling distances leading to a slower construction process, hamper the ability of the project to meet the critical mission criteria, or a combination of these factors.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The attached Environmental Assessment (EA) provides an evaluation of the potential environmental consequences from implementing the Proposed Action and is incorporated into this Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA) by reference. The EA demonstrates that the Proposed Action to excavate the north hill by 2,000,000 cy would not result in a

significant adverse impact to environmental resources. A summary of resources with potential environmental consequences is presented below.

Aesthetics. Impacts to aesthetics under the Proposed Action are anticipated to be minor. Excavation and vegetation removal would temporarily clear the areas on the north hill and disposal site. Following construction, both would be allowed to return to a vegetated state, which would be similar to current conditions. There would be no significant impact to aesthetic conditions resulting from the Proposed Action.

AICUZ/Land Use. During construction, use of machinery that emits smoke and light could potentially disrupt flight operations. These impacts would be temporary and minor, since smoke would disperse rapidly and lights would only be needed during periods of darkness when flight time restrictions from 10pm to 7am preclude aircraft operation. Impacts to the acoustic environment under the Proposed Action are anticipated to be minor. There would be no significant impact to AICUZ restrictions. Recreational uses of the site are minimal and would not change as a result of the Proposed Action. There would be no impact to land uses, as there would be no change to land uses, or availability of land uses, and no impacts to existing communities. Impacts to the acoustic environment would be short-term and minor and therefore, less than significant.

Acoustic Environment. Noise modeling shows that construction noise would be audible near the project site but would attenuate to below DNL noise levels before reaching the nearest buildings. At the nearest buildings (0.25 mile away), construction noise would be approximately 57 dBA, which is well below the ambient DNL sound level of 78 dBA at these sites. The nearest sensitive receptors 1.75 miles southwest of the project site would not be able to hear construction noise. Workers at the construction site would also experience increased noise levels. Workers would wear adequate hearing protection as appropriate and in accordance with the project health and safety plan and applicable occupational health and safety regulations, so adverse effects would be minor. Project activities are not expected to impact aircraft noise patterns and acoustic contours for the base would not change as a result of the project. Overall, short-term effects on the acoustic environment would be minor; no significant impacts would occur.

Air Quality. During construction, minor and temporary impacts to project area air quality would result through earth moving required to excavate and dispose of soils, and emissions from construction equipment and employee vehicles. Mitigation measures would include covering soil stockpiles, applying water to excavation areas to control fugitive dust, setting low speed limits to reduce dust generation, and restricting idling vehicles to a maximum of 5 minutes. Emissions modeling shows that estimated construction emissions would be well below the criteria pollutant emissions levels. Impacts to air quality would be less than significant.

Hydrology and Water Quality. Impacts to surface water may include loss of wetlands, pollution, and diversion of seasonal drainages. Temporary but negligible increases in solids, turbidity, and pollutants from construction equipment would also be expected from construction activities. Impacts would be minimized to less than significant by adherence to stormwater management measures and BMPs identified in a project-specific Stormwater Pollution Prevention Plan (SWPPP) and the EA. Impacts related to elevated sediment concentrations would be temporary, lasting primarily for the one or two

seasons of excavation and disposal for most areas, and would be intermittent, occurring only during precipitation events and snowmelt runoff. These impacts would be less than significant. Storage of surface water in the wetlands would be reduced relative to current conditions, which may increase runoff during snowmelt or precipitation. Although this impact is adverse, it would be less than significant, since adequate measures are in place to manage increased runoff. There are no permanent or substantial streams in the excavation or disposal areas, so diversion of drainages within the project area would be a less than significant impact to water quality or water supply.

Safety and Occupational Health. Work at the hill removal area would occur approximately 1,500 feet north of Runway 16/34 inside an airfield clear zone or APZ I and, in the southeastern corner of the excavation area, within a QD arc. Although there is an elevated risk of an aircraft accident or explosion in these areas compared to other areas, the risk is still small and not significant. Construction activities would present typical construction site safety risks to workers. These risks would be minimized by complying with occupational health and safety regulations and implementing standard construction site safety BMPs. Implementing the Proposed Action would have a substantially beneficial effect on the safety of flight operations at JBER. Currently, the runway does not meet UFC 3-260-1 approach-departure surfaces criteria or FAR Part 77 flight path obstruction criteria. Removing the hilly terrain north of the runway would bring the runway into compliance with UFC 3-260-1 and FAR Part 77, eliminating the need for waivers and increasing the safety of flight operations. There would be no significant adverse impact to safety and occupational health, and instead, there would be beneficial impacts resulting from improvement of approach-departure surfaces conditions.

Hazardous Materials/Waste. Construction activities involve common hazardous materials and petroleum products. Safe handling and use of these materials is managed through the JBER Environmental Management Plan (EMP), which includes BMPs for materials management, handling, spill response, and worker training. In addition, the preparation of the SWPPP includes hazardous materials and spills response requirements for the construction site. There are no known hazardous materials at the site. Response to discovery of these materials would be guided by applicable regulations, USAF policy and procedures, and the EMP.

Biological Resources. Impacts to vegetation would be temporary and minor. There would be a temporary loss of mature forest at the disposal site, and a permanent transition of disturbed forest to low shrub and understory habitat on the excavated hill. Following construction, the disposal site would be allowed to regenerate and eventually return to mature native forest. The excavation site would continue to transition to low native shrub and understory habitat, as has been underway since the installment of Elmendorf AFB, and which is also JBER policy for glide path areas. Facilitation of native plant regrowth would be improved by stockpiling and reuse of the top layer of soil in excavation areas. There would be no significant impacts to vegetation under the Proposed Action.

Excavation of the glide path and disposal of excavated materials would both result in the infilling and alteration of existing wetlands. None of the wetlands to be affected are jurisdictional and therefore, there would be no significant impact to jurisdictional wetlands under the Proposed Action. The functional effect of loss of these wetlands include reduced habitat for birds and wildlife that may rely on wetlands during all or part of their lifecycle, reduced water storage, and potential effects to nearby

water bodies due to altered groundwater movement. These wetlands may be accessed at various times by moose and numerous avian species. However, given the high level of disturbance of the surrounding area by ongoing excavation, and because ample suitable habitat for these species exists in the surrounding area, loss of this habitat is likely to be less than significant. Over time, some areas could potentially return to wetland conditions, if soil conditions and groundwater table are appropriate. JBER would manage vegetation throughout the excavation area for Clear Zone characteristics, including making sure that no open water areas form. As a result, if any wetlands reoccur, they would be dominated by low growing willows and other shrubs. Due to the relatively small area of wetland loss and the availability of other wetlands nearby, effects to wildlife associated with wetlands would be less than significant. There would be no significant impacts to wetlands.

Construction activities would have temporary and minor affects on wildlife, which would avoid construction areas due to noise and human presence. Prior to construction initiation, biological surveys would be conducted to ensure that no nesting birds are in the project area. There are no threatened or endangered species that use the construction area or any adjacent areas. Following construction, the excavation site would be managed as a Clear Zone, where preferred vegetation communities include 60 percent or more cover of native shrub and understory. The disposal site would be allowed to naturally reestablish upland native forest. Based on the nature of the Proposed Action and the measures taken to avoid impacts to habitat, there would be no significant impacts to wildlife.

Cultural Resources. There are no known cultural resources within the project area, and therefore no impacts to cultural resources are anticipated to occur under the Proposed Action. In the event of discovery of previously unknown cultural resources, activity at the site would immediately cease and a report to the 673 ABW Cultural Resources Manager would be made. Project work would resume after clearance by the manager. There would be no significant impacts to cultural resources.

Earth Resources. Changes in site topography may alter drainage patterns on the excavated hillside and result in temporary increases in erosion potential until vegetation had ample time to reestablish. Control measures and BMPs described in the SWPPP would remain in place to ensure that impacts are less than significant. These measures would include actions to minimize soil exposure, establish buffer strips, control stormwater discharges and flow rates, protect steep slopes, protect storm drain inlets, stabilize roadways, control fugitive dust, and stabilize soils with mulch or other materials. With the use of these control measures, any potential impacts to geologic, soil, and topographic resources would be less than significant.

Socioeconomic Resources. The Proposed Action would not result in significant adverse impacts to the socioeconomics of the area. Instead, minor beneficial effects would result from construction activity, which would increase commerce in the local economy.

Transportation. During construction, use of Dena'ina Road and surrounding haul roads would be markedly increased by truck traffic. If closure of Dena'ina Road were necessary, coordination with JBER Public Affairs and Security Forces would be conducted to minimize impacts to motorists and emergency responders. If needed, an alternate emergency service route would be identified. Due to the large number of truck trips proposed under this alternative, additional maintenance of Dena'ina Road may be

required, but it would be limited to the area between the excavation and disposal sites. Maintenance measures may include regrading, adding fill material in eroded sections, shoring up of slumps at the edge of the road, and maintaining drainage ditches on either side of the road. Following construction, transportation routes would not host additional traffic beyond current levels and. With adequate transportation planning, there would be no significant impacts to transportation resources.

No Action Alternative. In addition to the Proposed Action, as required under NEPA regulations, the No Action Alternative was evaluated. Under the No Action Alternative, JBER would be forced to continue operation under the condition of non-compliance with UFC 3-260-1 criteria and FAR Part 77. JBER would continue to need FAA and USAF flight safety regulation waivers to operate. The potential for nonrenewal of waivers would compromise mission readiness at JBER.

CONCLUSIONS

Finding of No Significant Impact

Based on the findings of this EA conducted in accordance with requirements of the National Environmental Policy Act, the Council of Environmental Quality regulations, and 32 CFR Part 989, et. Seq., and after careful review of the potential impacts, implementation of the Proposed Action and disposal of material in the site northwest of Dena'ina Road (Alternative 2) would not result in significant impacts to the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact is warranted and an Environmental Impact Statement (EIS) is not required for this action.

_____ _____

Date

GEORGE T.M. DIETRICH III
Colonel, USAF
Commander

Finding of No Practicable Alternative

Pursuant to Executive Order (EO) 11990, *Protection of Wetlands*, if a federal government agency proposes to conduct an activity in a wetland, it will consider alternatives to the action and modify its actions, to the extent feasible, to avoid adverse effects or potential harm.

The attached Environmental Assessment identified five alternatives and the No Action Alternative to meet the purpose and need. Due to logistical, safety, and environmental factors it was determined that the only reasonable and practicable alternative that meets the purpose and need is located in a non-jurisdictional wetland at a depressional area northwest of Runway 16/34.

Under the preferred alternative, up to 8.7 acres of wetlands in the excavation area would be altered and up to 8.5 acres of wetlands in the disposal area would be filled. Overall, a total of 17.2 acres of wetland would be affected by this project. U.S. Army Corps of Engineers review of wetland delineation reports, prepared for wetlands at both the excavation site and disposal site, has concluded that none of the

wetlands at either the extraction or disposal sites are jurisdictional, and therefore are not regulated wetlands. All wetlands were determined to be isolated, intrastate, and non-navigable, with no connection to interstate or foreign commerce. Therefore, a Department of the Army permit is not required for any wetlands that would be affected at the disposal site (POA 2015-556) or excavation site (POA-2014-531). Since the wetlands lack connectivity, including significant nexus to any anadromous or Water of the U.S., by definition, they do not have any significant value to anadromous fish species or the federally endangered Cook Inlet beluga whale. The Air Force will take preventative measures to the extent practicable to store the seed bank and top soil found in the disposal site, as recommended by the U.S. Fish and Wildlife Service. The top soil will be removed prior to material disposal and spread out on the filled area once excavation has completed.

Based on the referenced Environmental Assessment, there is no practicable alternative to implementing the Proposed Action to excavate the north hill and deposit excavated materials into the proposed disposal site.

_____ _____

MARK C. DILLON
Major General, USAF
Vice Commander

Date

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Acronym List

ABW	Air Base Wing
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFB	Air Force Base
AFI	Air Force Instruction
AICUZ	Air Installation Compatible Use Zone
APE	Area of Potential Effect
APZ	Accident Potential Zone
AWACS	Airborne Warning And Control System
BMP	Best Management Practices
CEQ	Center for Environmental Quality
CFR	Code of Federal Regulations
CMT	Culturally Modified Trees
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
cy	Cubic Yards
dBA	A-weighted Decibel
dB	Decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process

EMP	Environmental Management Plan
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FONPA	Finding of No Practicable Alternative
GAP	Gap Analysis Program
GHG	Greenhouse Gas
IDP	Installation Development Plan
IICEP	Interagency/Intergovernmental Coordination or Environmental Planning
INRMP	Integrated Natural Resources Management Plan
JBER	Joint Base Elmendorf-Richardson
Leq	Equivalent Sound Level
Lmax	Maximum Sound Level
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
NOAA-NMFS	National Oceanic and Atmospheric Administration-National Marine Fisheries Service
NOI	Notice of Intent
NRHP	National Register of Historic Places
O_3	Ozone

OSHA	Occupational Safety and Health Act
Pb	Lead
PM_{10}	Particulate Matter Less than 10 Microns
$PM_{2.5}$	Particulate matter Less than 2.5 Microns
ppm	Parts per Million
QD	Quantity-Distance
ROG	Reactive Organic Gases
RW	Runway
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
UFC	Unified Facilities Criteria
µg/m3	Micrograms per Cubic Meter
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

This environmental assessment (EA) evaluates the potential environmental effects of implementing alternative actions to ensure safe flight operations at Elmendorf Airfield, located northeast of Anchorage. Joint Base Elmendorf-Richardson (JBER) consists of the former Elmendorf Airfield and U.S. Army lands, formerly known as Fort Richardson. JBER's proximity and access to Asia, Europe, and North America provides a strategic location and yields significant importance to global military operations. The 673d Air Base Wing (ABW) is the host unit for JBER. Elmendorf Airfield is home to the 525th and 90th Fighter Squadrons, using a total of 42 primary assigned F-22 Raptors to carry out their mission. JBER is also home to eight Boeing C-17 Globemaster military transports, 16 Lockheed C-130 Hercules military transports, five Beechcraft C-12 Huron passenger and transport aircraft, two Boeing E-3 Sentry Airborne Warning and Control System (AWACS) aircraft, and 5 Sikorsky HH-60G Pave Hawk helicopters.

The airfield hosts two runways; Runway 16/34, which is oriented north-south, and Runway 06/24, which is oriented east-west. Both runways are heavily utilized to accommodate a large volume of commercial, general aviation, and military operations for both military and non-military aircraft. All aircraft landing at JBER follow a glide path, which is the approach angle and direction that an aircraft follows when landing. Safe flight operations at Elmendorf Airfield are compromised by topographical constraints to the optimum flight glide path of the north-south runway. Currently, use of Runway 16/34 requires waivers from U.S. Air Force (USAF) and Federal Aviation Administration (FAA) standards for safe operations, resulting from the topography to the north of the runway, where the elevation of hills precludes optimum flight glide paths.

The Proposed Action evaluated under this EA is intended to eliminate the need for flight waivers and ensure the safety of flight operations by establishing a suitable glide path, or angle of approach, to the north of the north-south runway to ensure USAF conformance with the Unified Facilities Criteria (UFC) 3-260-1 and the Federal Aviation Regulations (FAR) Part 77. Under current conditions, the presence of the north hill and the vegetation on the north hill within the glide path force pilots to approach Runway 16/34 at an angle that is steeper than what is normally considered safe or optimal. Therefore, under the Proposed Action, the portion of the north hill within the glide path would be excavated downwards for up to 30 feet, and allowed to revegetate with low-growing vegetation that would not interfere with flight operations.

North hill excavation began several years ago and disposal of excavated material has been accommodated by existing disposal sites. However, it is projected that 2,000,000 additional cubic yards (cy) of earth would need to be removed from the hill, and currently-used disposal sites could only receive about 400,000 cy of that material. This EA evaluates the Proposed Action of excavation of 1,600,000 cy of materials from the north hill and disposal of the excavated material in a depression in the vicinity of the excavation area.

This EA also evaluates the no action alternative, under which there would be no additional excavation of the north hill glide path, and where currently existing elevations and topographical features would remain. The USAF would continue to apply for waivers to standards for flight operations.

Four additional alternatives were considered during the initial planning stages of the EA but were subsequently eliminated from further consideration because they would not meet the alternative selection standards, which include the following:

- Flight waiver for hill obstruction must be removed by end of 2018.
- Disposal site cannot be more than a 1 mile drive from the hill extraction site.
- Haul routes must use existing transportation infrastructure suitable for 40-yard dump trucks
- Disposal material cannot create additional flight safety risks.

After elimination of non-practicable alternatives, one potential action alternative was identified: excavation of the hill north of the runway and disposal of soil on site in a depression to the west of the excavation area. The Proposed Action would include three main types of actions, including 1) clearing the disposal area of trees, 2) excavating soil from the hill and transporting to the disposal area, and 3) closing the excavation and disposal areas. The period of excavation would begin in 2017 and continue into 2018, if needed. Excavation would begin after spring thaws and continue until fall, typically May to October. During that time, equipment would be onsite and trucks would be completing haul trips between the excavation site and disposal site 6 days a week for approximately 18 hours per day.

In this EA, the action alternative, or Proposed Action, is compared to the no action alternative to determine the potential impacts to the environment. Table ES-1 provides a summary of potential environmental consequences resulting from the Proposed Action and no action alternatives. In general, the Proposed Action would lead to less than significant effects to wetlands, air quality, water quality, earth resources, socioeconomics, and transportation. The no action alternative may compromise the safety of flight crews and aircraft and the ability of the USAF to fully complete its mission at JBER.

Table ES-1 Summary of environmental consequences of the Proposed Action and No Action alternatives and mitigation actions to reduce impacts

Resource Category	Effects of No Action	Effects of the Proposed Action	Avoidance, Reduction or Mitigation of Effects of the Proposed Action
Aesthetics	• No effects to aesthetic or visual resources	• Loss of forest cover in excavation area would temporarily affect viewshed	• Allow natural revegetation of excavation and disposal areas with appropriate native vegetation
Air Installation Compatible Use Zone (AICUZ)/ Land Use/Acoustic Environment	• No change to land uses or ongoing noise levels	• Short-term noise increases in the vicinity of the excavation area • Minor emissions of particulate matter and light during excavation • Minor loss of recreational opportunities in excavation area during excavation period	• None
Air Quality	• No change to current air emissions or other air quality conditions	• Short-term increase in local emissions resulting from continuous truck traffic and use of heavy equipment • Minor increases in emissions of particulate matter measuring less than 10 microns in diameter (PM_{10})	• Soil stockpiles would be covered • Apply water from water trucks to excavation areas, access and haul roads, and staging areas as needed to control fugitive dust • Set a low speed limit on access roads to reduce dust generation • Restrict idling of excavation vehicles and machinery to a maximum of 5 minutes
Water Resources	• Ongoing excavation project suspended for winter of 2016 would not be started again in 2017. Site would be revegetated and monitored for erosion and sediment in stormwater runoff	• Potential increase in surface water runoff • Loss of up to 17.2 acres of non-jurisdictional wetlands may affect water storage during precipitation or runoff • Temporarily increased sediment concentration in runoff	• Implementation of Best Management Practices (BMPs) identified in a Stormwater Pollution Prevention Plan (SWPPP)
Safety and Occupational Health	• Continued non-compliance with UFC 3-260-1 criteria and FAR Part 77 • Continued need for FAA and USAF flight safety regulation waivers and potential for nonrenewal of waivers, which would compromise mission readiness at JBER	• Short-term excavation safety risks	• Compliance with Occupational Safety and Health Act (OSHA) and site BMPs • USAF would prepare FAA Form 7460-1, Notice of Proposed Construction or Alteration at least 45 days before the start of construction

Resource Category	Effects of No Action	Effects of the Proposed Action	Avoidance, Reduction or Mitigation of Effects of the Proposed Action
Hazardous Materials/Waste	• No change to current hazardous waste or materials that may be onsite	• No known areas of contamination would be disturbed	• Compliance with applicable regulations, USAF policy and procedures, and the JBER OPLAN 19-3 *Environmental Management Plan* (EMP)
Biological/Natural Resources	• No impacts to existing natural resources	• Temporary loss of mature forest at 22-acre disposal site • Permanent transition of disturbed forest to low shrub and understory habitat • Permanent loss of 17.2 acres of emergent and shrub wetland • Temporary disturbance to wildlife in the area	• Natural revegetation of 22-acre disposal site and eventual return of mature native forest • Natural revegetation of disturbed forest to native shrub vegetation in the excavation area • Stockpiling and reuse of top layer of soil excavated from disposal area • Preliminary surveys to ensure active nests or dens are not disturbed
Cultural Resources	• No impacts to cultural resources	• No impacts to cultural resources unless unknown sites are located during excavation	• On-call cultural resources professional to be available at all times for potential discovery of artifacts or human remains
Earth Resources	• No change to topography, geology, soils, or minerals	• Temporary disturbance of soils • Short-term increase in dust and potential for erosion • Minor alterations to topography	• Implementation of BMPs from the SWPPP
Socioeconomic Resources	• Minor adverse effects to socioeconomics due to reduced business activity associated with ongoing excavation	• Minor beneficial effects from increased revenue to local construction and engineering industries	• None
Transportation	• No effects to transportation network or traffic levels	• Less than significant impacts from increased traffic on Dena'ina Road • Increased wear on Dena'ina Road from use of heavy machinery	• Installation of signs alerting drivers to presence of machinery • Flaggers would be employed if needed to control traffic • Dena'ina Road would be maintained as needed to ensure trucks and other vehicles have safe conditions

1 Purpose of and Need for Action

1.1 Introduction

This environmental assessment (EA) evaluates the potential environmental effects of implementing alternative actions to ensure safe flight operations at Elmendorf Airfield, which is part of Joint Base Elmendorf-Richardson (JBER). Hilly terrain north of Runway 16/34 obstructs the flight path for arriving and departing aircraft, and the site requires annual waivers from U.S. Air Force (USAF) and Federal Aviation Administration (FAA) standards for safe operations of aircraft using this runway.

Located north and east of Anchorage, Alaska, JBER consists of the former Elmendorf Airfield and U.S. Army lands, formerly known as Fort Richardson. JBER-Elmendorf has an area of 13,130 acres (Figure 1-1).

Construction of Elmendorf Field began in June 1940, with service personnel arriving in August 1940. While the site began as an Army facility (Fort Richardson), Air Force personnel began working on-site in February 1941. After World War II, the Army moved its operation to the new Fort Richardson. The Air Force assumed control of the original Fort Richardson and renamed it Elmendorf Air Force Base (AFB). In 2005, the Defense Base Realignment and Closure Commission Report established the new joint base, combining Elmendorf AFB and Fort Richardson into a single unit known as JBER (USAF 2016a).

As JBER's host unit, the 673 Air Base Wing (ABW) provides administrative and logistical support to U.S. Army components of U.S. Army Alaska , 11th Air Force, 3d Wing, 176th Wing, 732nd Air Mobility Squadron, 373d Intelligence, Surveillance, and Reconnaissance Group, 611th Air Operations Group, 611th Air Support Group, the Air Force Reserve's 477th Fighter Group, the Canadian Forces Detachment, the Marine Corps' Reserve Training Center, the U.S. Army Corps of Engineers (USACE) District Office, and several other smaller supporting units (USAF 2016b).

The 3d Wing includes the 525th Fighter Squadron and the 90th Fighter Squadron. The fighter squadrons at JBER use the F-22 Raptor in carrying out their mission. A total of 42 primary assigned F-22s are based at JBER. In addition, JBER is home to eight Boeing C-17 Globemaster military transports, 16 Lockheed C-130 Hercules military transports, five Beechcraft C-12 Huron passenger and transport aircraft, two Boeing E-3 Sentry Airborne Warning and Control System (AWACS) aircraft, and 5 Sikorsky HH-60G Pave Hawk helicopters.

The airfield includes two runways – an east-west runway (Runway 06/24) and a north-south runway (Runway 16/34) (Figure 1-1). Both are Class B asphalt runways.

The east-west runway (Runway 06/24) is 10,000 feet long and 200 feet wide. It uses the tactical air navigation system and is limited to use by military aircraft (Global Air 2016).

The north-south runway, Runway 16/34, is the subject of this EA. It is 7,493 feet long and 150 feet wide. For approaches from the north, the runway is designated as 16, whereas for departures to the north, the runway designation is 34 (Figure 1-1). This runway has a topographic hazard in the form of a hill to the north, and air traffic restrictions to the south. The presence of the hill to the north affects the glide path, which is the angle at which aircraft approach or depart from the runway.

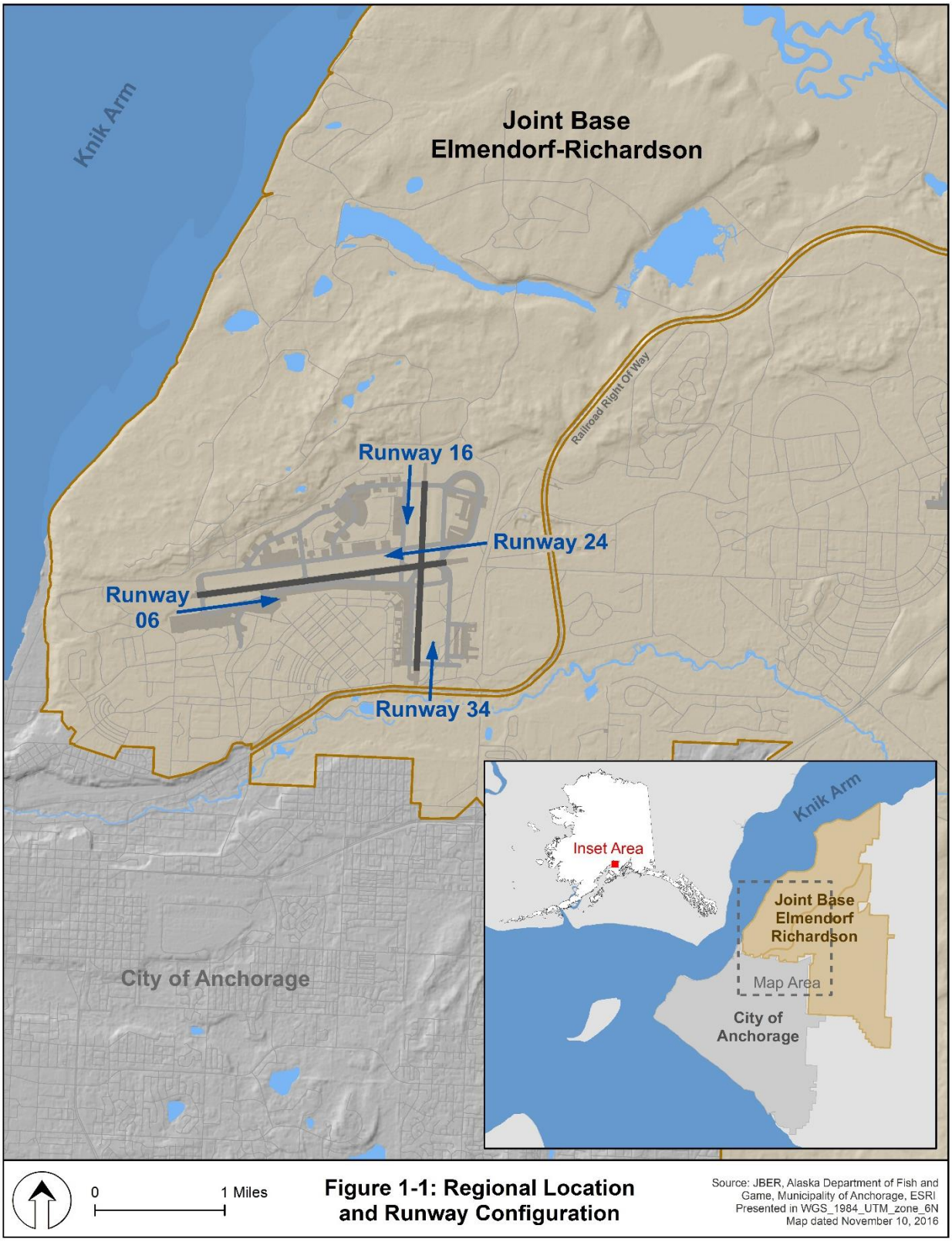

Figure 1-1: Regional Location and Runway Configuration

Source: JBER, Alaska Department of Fish and Game, Municipality of Anchorage, ESRI
Presented in WGS_1984_UTM_zone_6N
Map dated November 10, 2016

1.1.1 Runway Constraints

The complexity of the Anchorage Bowl airspace and the large volume of commercial, general aviation, and military operations cause runway utilization conflicts with military and non-military aircraft. To the west of Elmendorf Airfield is Ted Stevens International Airport and Lake Hood, a small civilian airfield. Directly to the south lies Merrill Field and to the east is Bryant Army Airfield. The main runway pattern for military aircraft is to depart east on Runway 06/24 or north on Runway 16/34 and arrive on Runway 06/24. The segment at Merrill Field makes it difficult to depart or arrive south of Elmendorf Airfield.

Runways at Elmendorf Airfield require seasonal maintenance due to the harsh arctic conditions. The environment is extremely hard on paved surfaces, and annual maintenance and periodic repaving are required to stabilize the runway. Typically, runway maintenance closes Runway 16/34 for two weeks in May, and Runway 06/24 is closed for one month in July and/or August. When Runway 16/34 is closed, all flight traffic is diverted to Runway 06/24, and when Runway 06/24 is closed, flight traffic is diverted to Runway 16/34.

1.1.2 2006 Port of Anchorage Expansion Project

As part of the Port of Anchorage expansion project, which began in 2006, the U.S. Department of Transportation, Maritime Administration proposed to remove approximately 9.8 million cubic yards (cy) of soil from an area north of Runway 16/34 in JBER as fill material for the port expansion (Figure 1-2; POA 2006 EA). In the end, approximately 5 million cy of material were extracted for use as fill in the port. The unused material left behind once the port project was completed remains a flight safety hazard in its current condition.

1.2 Purpose of the Action

The purpose of the Proposed Action is to eliminate the need for flight waivers and to ensure the safety of flight operations at Elmendorf Airfield by reducing physical hazards, in particular the topographic obstruction to the north of Runway 16/34. The current waiver is attached as Appendix A.

1.3 Need for the Action

The Proposed Action is needed to ensure USAF conformance with the Unified Facilities Criteria (UFC) 3-260-1 and the Federal Aviation Regulations (FAR) Part 77, and thereby ensure the safety of flight operations at Elmendorf Airfield. UFC 3-260-1, Airfield and Heliport Planning and Design (November 2008), and FAR Part 77 documents provide criteria for establishing unobstructed airspace and safe and efficient ground movements around USAF runways and U.S. airports, respectively.

In its current configuration, Runway 16/34 does not meet UFC 3-260-1 approach-departure surfaces criteria. Runway operations require USAF to implement waivers for flight safety criteria. Figure 1-2 shows imaginary surfaces associated with the north end of Runway 16/34. Waivers for incompatibility within imaginary surfaces can be granted to air regulations on a temporary basis. Such waivers require that actions be taken to mitigate the danger until the hazard can be corrected. In addition, action to eliminate the waiver is required in order to comply with FAA and Air Force standards. Work to reduce the topographic obstruction has been underway for several years since the completion of the Port of Anchorage expansion project. However, areas previously used for disposing of the excavated material have almost reached capacity and it is necessary to identify new sites into which the remaining material can be placed.

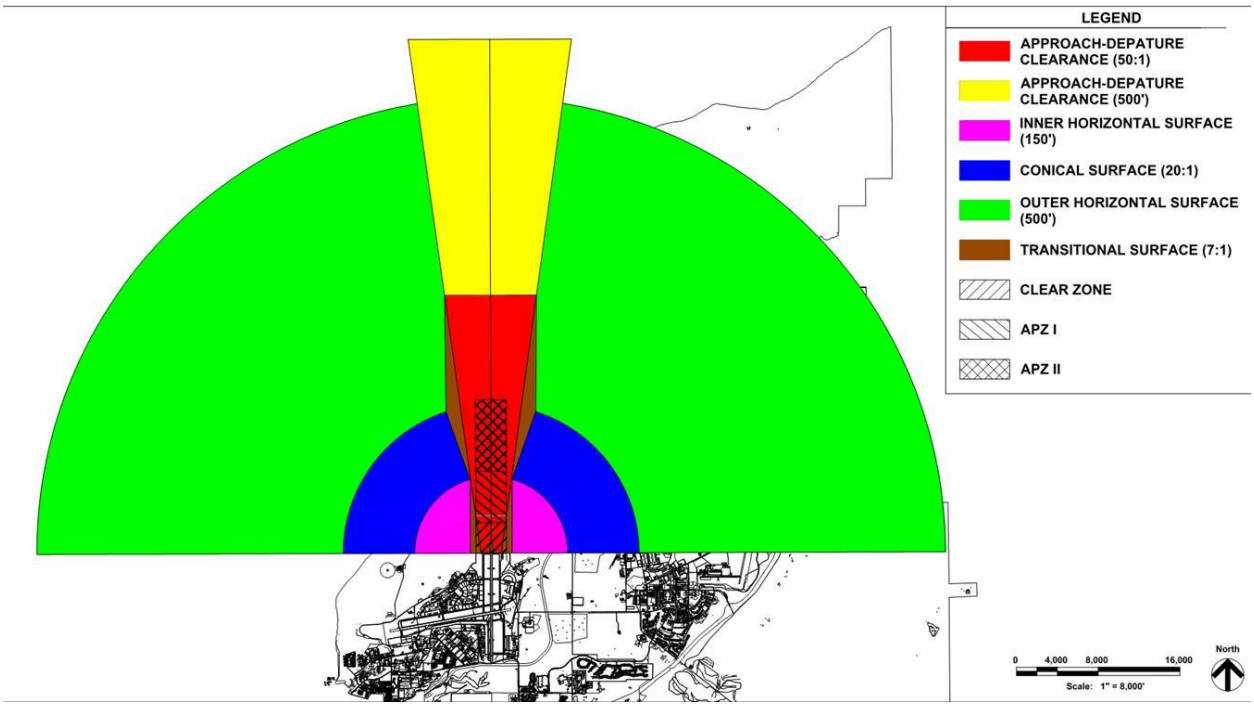

Figure 1-2: Imaginary Surfaces Associated with the North End of Runway 16/34

1.4 Decisions to be Made

The information in an EA is used as the basis for a decision to issue a Finding of No Significant Impact or to undertake a more detailed environmental review in the form of an Environmental Impact Statement, with a subsequent Record of Decision. This decision would be made by the USAF.

Furthermore, in accordance with the requirements of Air Force Instruction (AFI) 32-7064, Section 4.1, if the proposed action would affect wetlands, and no practicable alternative that would avoid effects to wetlands is identified, the USAF would also prepare a Finding of No Practicable Alternative (FONPA).

1.5 Public Participation and Intergovernmental Coordination/Consultations

Public participation opportunities are guided by Center for Environmental Quality (CEQ) regulations published at 40 Code of Federal Regulations (CFR) Parts 1500-1508 and the requirements of 32 CFR Part 989 EIAP.

1.5.1 Interagency and Intergovernmental Coordination and Consultations

The USAF sent Interagency/Intergovernmental Coordination Letters for Environmental Planning (IICEP) to the agencies listed in Table 1-1 on 15 August, 2016. The IICEP process is used to define the scope of the analysis. It also provides agencies and interested groups an opportunity for early input regarding potential effects associated with the proposed action and to propose any alternatives that meet the purpose and need of the proposed action.

Government to Government coordination letters were submitted to Alaska Native Villages/Tribes and Alaska Native Corporations for their inclusion in the NEPA process.

Table 1-1: Recipients of IICEP Letters

Organization	Division
Alaska Department of Environmental Quality	Division of Air Quality
Alaska Department of Environmental Conservation	Division of Environmental Health
Alaska Department of Environmental Conservation	Division of Water
Alaska Department of Fish and Game	Division of Wildlife Conservation
Alaska Department of Natural Resources	Division of Mining, Land, and Water
Alaska Department of Natural Resources	Office of the Commissioner
Alaska Department of Natural Resources	Division of Parks and Outdoor Rec
Alaska Department of Natural Resources	Division of Forestry
Alaska Department of Natural Resources	Division of History & Archaeology
National Marine Fisheries Service	Protected Resources Division
U.S. Department of Interior	Office of Environmental Policy & Compliance
Bureau of Land Management	Anchorage Field Office
U.S. Fish and Wildlife Service	Anchorage Fish & Wildlife Field Office
Municipality of Anchorage	Community Planning & Development
Ted Stevens International Airport	NA
Federal Aviation Administration	NA
Community Councils Center	NA

A public notice was made available to the public through the Alaska Dispatch News as well as on the JBER public website (http://www.jber.us.af.mil/environmental.aspx) to announce that the USAF was considering a project that occurs within a wetland. This notice was prepared to provide early notification for the interested public as required under Executive Order (EO) 11990, Protection of Wetlands. It was released to the public as an ad in the Alaska Dispatch News on March 2, 2017 (Appendix C). This EA will be made available on JBER's public website during the public review period, along with information regarding the public review process and instructions on how to submit comments.

1.6 Regulatory Compliance

This EA analyzes the potential environmental consequences associated with the North Runway Hill Removal project at JBER. This EA has been prepared by the USAF in accordance with NEPA; Department of the Air Force EIAP, 32 CFR 989 (in particular section 989.14); 40 CFR 1508 (in particular section 1508.9); AFI 32-7064, Integrated Natural Resource Management; and the Department of Defense (DoD) Instruction 4715.03 Natural Resources Conservation Program. The USAF is preparing this EA to consider the potential consequences to the human and natural environment that may result from implementation of the Proposed Action.

1.6.1 National Environmental Policy Act

NEPA requires federal agencies to consider the potential environmental consequences of proposed actions in their decision-making process. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. The CEQ was established under NEPA to implement and oversee federal policy in this process.

The activities addressed within this document constitute a federal action, and therefore must be addressed in accordance with NEPA. To comply with NEPA, as well as other pertinent environmental requirements, the decision-making process for the Proposed Action includes the development of an EA to identify and describe the environmental issues related to the proposed activities.

1.6.2 Wetlands

EO 11990, Protection of Wetlands, requires that each federal agency provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. In cases where impacts to wetlands are unavoidable, an agency shall demonstrate that there are no practicable alternatives, and the Proposed Action includes all practicable measures to minimize harm to wetlands. The early notice released on October 24, 2016 ensures that the USAF is in compliance with public notice requirements of this EO.

1.6.3 Cultural Resources

The National Historic Preservation Act (NHPA) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation, outlining procedures for the management of cultural resources on federal property.

Cultural resources can include archaeological remains, architectural structures, and traditional properties such as ancestral settlements, historic trails, and places where significant historic events occurred. NHPA requires federal agencies to consider potential impacts to cultural resources that are listed, nominated to, or eligible for listing on the NRHP; designated a National Historic Landmark; or valued by modern Alaska Natives for maintaining their culture. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. 36 C.F.R 800, Protection of Historic and Cultural Properties, provides an explicit set of procedures for federal agencies to meet their obligations under Section 106, which includes inventorying of resources and consulting with State Historic Preservation Officers (SHPOs).

The preservation of Alaska Native cultures is coordinated by the SHPO, as mandated by the NHPA and its implementing regulations. Government-to-Government consultation letters submitted to Alaska Native Villages/Tribes and Alaska Native Corporations ensure compliance with Section 106 requirements.

1.6.4 Other Regulations

In addition to the regulations described above, this EA considers the proposed project's compliance with all applicable laws, regulations, and EOs, including but not limited to:

Clean Air Act (CAA)

Clean Water Act (CWA)

Endangered Species Act (ESA)

Migratory Bird Treaty Act (MBTA)

Occupational Safety and Health Act (OSHA)

AFI 32-7040 Air Quality Compliance

AFI 32-7065 Cultural Resources Management Program

EO 11514 Protection and Enhancement of Environmental Quality

EO 12372 Intergovernmental Review of Federal Programs

EO 12898 Environmental Justice

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2 Description of Proposed Action and Alternatives

CEQ regulations [40 CFR 1508.9(b)] and NEPA Section 102(2)(E) require that appropriate alternatives to the proposed action be studied, developed, and described. The "No-Action" Alternative must be included. Alternatives eliminated from detailed study should be identified, along with the reasons for their elimination. In this instance, the only outcome that would meet the purpose of and need for the project is the removal of the hill north of the runway. Other alternatives would not result in the ability of pilots to maintain a safe approach or for the USAF to maintain operational viability.

2.1 Proposed Action

The Proposed Action would bring flight operations that use Runway 16/34 into compliance with airspace clearance requirements specified in UFC 3-260-01 and FAR Part 77 by reducing the topography of the north hill to meet the 50:1 glide-slope requirement. Approximately 2.0 million cy of earth would be removed from the hill during the 2017 and 2018 excavation seasons, which would begin after the ground has thawed in the spring and end in the fall when the ground freezes or weather conditions are otherwise unfavorable to continued excavation. The excavation season is expected to extend from May through September.

Equipment used to transport the material would include up to ten 40-cy dump trucks, two excavators, as well as support and maintenance equipment. Operations would run 6 days a week for approximately 18 hours per day.

An existing fill material disposal site is located northwest of Runway 16/34. However, this disposal site only has capacity for approximately 400,000 cy of material, and additional location is needed for the remaining 1.6 million cy that will be excavated from the hill site. This EA considers the selection of the additional disposal site and consequential environmental impacts.

2.2 Selection Standards for Evaluating Alternative Actions

Selection standards, per 32 CFR 989.9(c) are used to evaluate the purpose of and need for an action, to screen alternatives, and to determine which alternative(s) meet(s) the purpose and needs of a proposed action.

The alternatives identified in this EA are described in Section 2.3 and consider the disposal of approximately 1.6 million cy of material. Physical constraints, including the presence of Ship Creek, eliminate the option of installing a runway extension to the south, leaving hill removal as the only practical action. Alternatives for disposal of excavated soils have been considered using the following selection standards:

Flight waiver for hill obstruction must be removed by end of 2018. Due to the availability of funding for hill-removal excavation activities, the project must be complete by the end of 2018. If hill removal is not completed by the end of 2018, there are no approved funds to complete the project (and thereby eliminate the need for a waiver) in a timely manner.

Disposal site cannot be more than a 1 mile drive from the hill extraction site. A one mile radius from the excavation site is required in order for the project to be completed prior to the end of the 2018 excavation season. Section 2.1 provides information on the equipment that will be used to excavate the material. Within a one mile radius, the haul trucks have approximately 30 minutes to load the material,

drive to the disposal site, dump the material, and return to the excavation site. Based on the amount of material to be disposed, the timeline for eliminating the need for the flight waiver, the number and size of trucks, and the time required to load and unload material, we have determined that the disposal site must be within 1 mile (driving distance) of the extraction site in order to complete work by the end of 2018.

Haul routes must use existing transportation infrastructure suitable for 40 yard dump trucks. Due to the size and weight of the equipment to be used for hauling material, roads used to transport the material must be capable of withstanding heavy loads. Existing roads on the base are suitable and can withstand the weight of the equipment. Use of the public road network is not compatible with the use of dump trucks.

Disposal material cannot create additional flight safety risks. Elmendorf airfield sits above the bluff the east of the Knik Arm. To the north, the general elevation of the ground increases until a ridge approximately 1 mile north of the centerline of Runway 16/34, and gradually slopes down until reaching Six Mile Lake, approximately 1.5 miles north of Runway 16/34. To the east of Runway 06/24 the elevation is primarily level due to previous excavation and ground disturbing actions. The southern portion of the airfield consists of general development such as buildings and infrastructure to support airfield and military activities. Movement of material into imaginary surfaces must not require a new airfield waiver cannot worsen existing conditions, as both scenarios would perpetuate the need for waivers.

2.3 Alternatives Considered

No Action Alternative - Under the No Action Alternative, hill removal activities north of Runway 16/34 would not continue. Waivers for the hill obstruction would continue to be sought as the hill violates the 50:1 glide-slope criteria and falls within the clear zone in UFC 3-260-01.

Soil Disposal at Site in Depression Northwest of Dena'ina Road – Material from the excavation site would be disposed of in a depression area northwest of Runway 16/34 and Dena'ina Road adjacent to where excavated material has previously been placed. Soil would be stored in accordance with U.S. Fish and Wildlife Service (USFWS) recommendations (USFWS 2016a), as follows:

> *To expedite succession of functional habitat, we suggest salvaging and re-spreading topsoil over disturbed areas, where possible. The first 10-12 inches of soil contains site specific native seed and organic matter that will ultimately conserve resources and promote infill with native vegetation. In areas with existing native vegetation, we suggest salvaging the organic topsoil (by soil type) and spreading the topsoil (by soil type) back over the disturbed areas after construction. Topsoil should be stored separately from subsoil, signed as topsoil, and stored in a manner that will keep it viable until it is spread back over the disturbed site. If placement of materials such as riprap is implemented to stabilize stream banks above or below stream crossings, we suggest the use of topsoil to fill the voids between the stones and seed the surface with native grasses and/or forbs to provide some habitat value and help stabilize the rock. If placement of materials to stabilize stream banks (i.e., riprap) is implemented above or below stream crossings, topsoil fillings within the voids between the stones and the surface seeded with native grasses and/or forbs is recommended to provide some habitat value and help stabilize the rock.*

Soil Disposal at Site East of Runway 06/24- Materials from the excavation site would be disposed of to the east of Runway 06/24 at an active gravel mining operation.

Soil Disposal at site West of Runway 06/24- Materials from the excavation site would be disposed of at the Cherry Hill disposal site west of Runway 06/24. This site is actively used to dispose material from the airfield and from construction projects near the airfield.

Soil Disposal at the Anchorage Regional Landfill- The Municipality of Anchorage has historically showed interest in utilizing material from JBER as cover material for closed waste cells. The Anchorage landfill is located north east of the airfield, approximately 9 miles away from the extraction site.

Soil Disposal Site North-East of Runway 16/34- Materials from the excavation site would be disposed of in a forested upland area northeast of Runway 16/34.

2.4 Application of Selection Standards

Table 2-1 is a matrix indicating how each of the alternatives discussed above meets the criteria presented in Section 2.2. Figure 2-1 outlines the relative location of each alternative from the excavation site.

Table 2-1: Comparison of Alternatives with Regard to Selection Standards

Alternative	No Action	Depression Area Northwest of Dena'ina Road	East of Runway 06/24	West of Runway 06/24	Disposal at Regional Landfill	Disposal Northeast of Runway 16/34
Flight waiver must be removed by calendar year 2018	N/A	Yes	No	No	No	No
Disposal site must be within 1 mile of the extraction site	N/A	Yes	Yes	No	No	Yes
Haul route(s) must use existing transportation routes suitable for 40-yard dump trucks	N/A	Yes	No	Yes	No	Yes
Disposal sites cannot be within Runway 16/34 Imaginary Surface Areas	N/A	Yes	Yes	No	Yes	Yes

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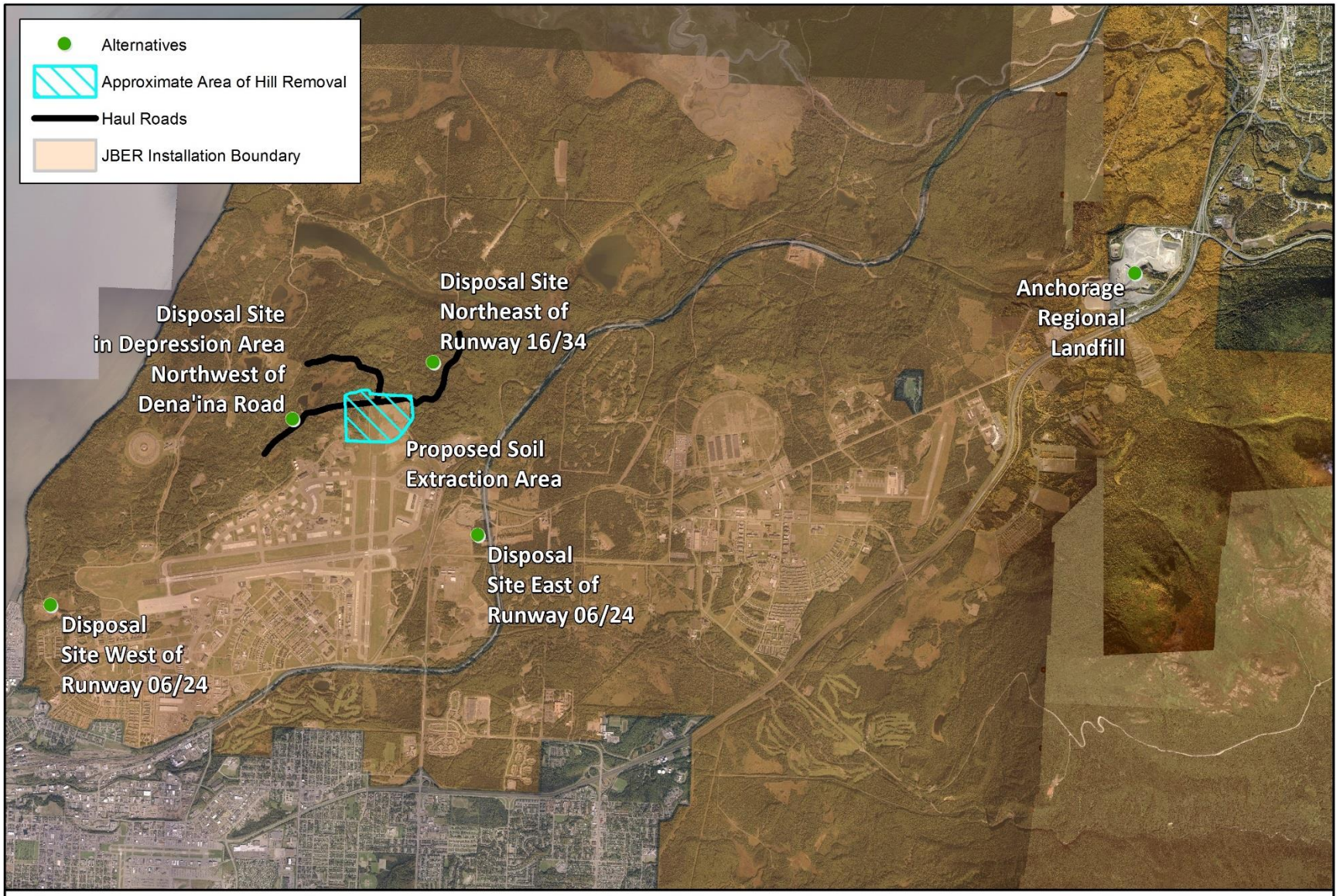

Figure 2-1: Locations of Alternatives

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2.4.1 Results from Application of Selection Standards

Depression Area Northwest of Dena'ina Road- The disposal site in the depression area northwest of Dena'ina Road is an approximately 0.75-mile drive from the extraction site. Minimal site work would be required to dispose of material. Tree removal would be required for approximately 22 acres of the disposal site, and could occur while the ground is frozen, when soil extraction is not feasible. The disposal trucks would either use Dena'ina Road or through routes developed for previous soil disposal activities. Dena'ina Road was developed during the 2006 Port of Anchorage Expansion project and could withstand the weight of the equipment. The disposal site is outside of all imaginary surface areas and therefore would not conflict with UFC 3-260-01. This alternative meets all screening criteria and is carried forward for further discussion.

Soil Disposal Site East of Runway 06/24- The disposal area west of Runway 06/24 would require trucks to drive approximately 3.75 miles each way to dispose material from the area north of Runway 16/34 which would utilize Dena'ina Road, which is suitable for use by 40-cy dump trucks. This distance exceeds the maximum distance and would prevent the proposed action from being complete by the end of the 2018 construction season. Due to the distance from the extraction site, completion by the end of 2018 is not feasible, thus, this alternative is not carried forward for additional discussion.

Soil Disposal Site West of Runway 06/24- The disposal area west of Runway 06/24 is more than 1 mile from the extraction site. The most direct route would utilize Dena'ina Road, which is suitable for use by 40-cy dump trucks. The site is within the approach-departure imaginary surface and, once unloaded, the 1.6 million cy of material could extend into the 50:1 glide slope. Due to the distance from the extraction site, completion by the end of 2018 is not feasible. Given these factors and additional impacts to existing flight operations, this alternative is not carried forward for additional discussion.

Soil Disposal Off-site at Anchorage Regional Landfill- The disposal area at the Anchorage Landfill is approximately 9 miles from the extraction site, and therefore disposal would extend beyond 2018. Access to the landfill would require usage of roads not designed to handle 40-cy dump trucks. The landfill is outside of all imaginary surface areas for the Elmendorf Airfield. Due to the distance, the resulting extended completion timeline, and the unsuitable road network, this alternative is not carried forward for further discussion.

Soil Disposal Northeast of Dena'ina Road- The disposal site northeast of Dena'ina Road is within a 1 mile drive of the extraction site and is outside of the imaginary surface areas for Runway 16/34. Trucks could use Dena'ina Road to access the southern portion of the disposal site. This disposal site would not allow for the flight waiver to be removed by 2018 due to the amount of site preparation work that would be necessary in order to clear 64 acres of vegetation and to employ safe disposal methods. Site preparation would include installation of a road within the site, grading to prevent sediment from entering the stormwater system, as well as clearing of vegetation before material disposal could occur. The general topography of the site is increasing in gradient towards the north, and therefore the site would need to be built up, rather than filled in. It is estimated that the disposal site would be elevated an average of 15.5 feet, which exceeds the safe limit standard height to which excavation equipment can place material. Building the site up requires additional efforts to minimize erosion and sedimentation increasing the time to safely build material up would require additional time. Therefore, based on the inability for this disposal site to allow for a project completion date by the end of 2018, this alternative is not carried forward for further discussion.

No Action Alternative-There are currently no available disposal sites for excavation operations to continue. The No Action Alternative is carried out for further discussion and analysis as required under CEQ regulations.

2.5 Alternatives Considered but not Carried Forward for Further Analysis

As indicated in Section 2.4, the following alternatives were considered but did not meet the selection criteria and were not carried forward for further analysis:

- Soil Disposal Site East of Runway 06/24
- Soil Disposal Site West of Runway 06/24
- Soil Disposal Off-site at Anchorage Regional Landfill
- Soil Disposal Northeast of Dena'ina Road

See Section 2.4 for a discussion as to why these alternatives were not carried forward for further analysis.

2.6 Detailed Description of Soil Disposal Sites Meeting Selection Standards

2.6.1 Disposal Site at Depression Area Northwest of Dena'ina Road

Under this alternative, hill removal activities immediately north of Runway 16/34 would continue in the spring/summer of 2017 and 2018. The excavation period usually extends from May through the end of September, but excavation may commence earlier if there is an early thaw. Implementing this alternative would require three main actions: 1) clearing trees from the proposed disposal area, 2) excavating soil from the hill and transporting to the disposal area, and 3) closing and revegetating the excavation and disposal areas.

Vegetation Clearing. The proposed disposal area is located in a forested area, and numerous trees are found there. There is also a dense understory of shrubs and herbaceous species. The site has been identified as an isolated wetland, meaning that it does not fall under the jurisdiction of the USACE. Trees would be cut with chain saws and hauled out to Dena'ina Road, then taken to a stockpile area and made available as firewood for the public. Trees would be removed prior to the migratory bird nesting season, which begins May 1. Stumps would be left in place and vegetation would be cut low to the ground to discourage use by wildlife.

Excavation, Transport, and Deposition of Soils. Approximately 1,600,000 cy of material would be transported to the proposed disposal area, which is a 22-acre depression located approximately ¾ of a mile from the excavation area (Figure 2-2). Most material transport would be on specified haul routes within the site, with one crossing of Dena'ina Road just southeast of the proposed disposal site. Since Dena'ina Road is used as a secondary route by base personnel to travel to and from the area north of the proposed action area, precautionary measures would be implemented in order to prevent vehicular collisions. The crossing would be well marked with signs and would be well-lit. Flaggers or other standard traffic control procedures would be used as safety conditions warrant.

Soil material would be deposited starting at the east edge of the disposal area and working in a northward direction until a workable platform of soil was created. Soils would then be deposited from the edge of the platform, working to the west. Soils would be pushed into the disposal area by a bulldozer and would be compacted by the weight of the machinery.

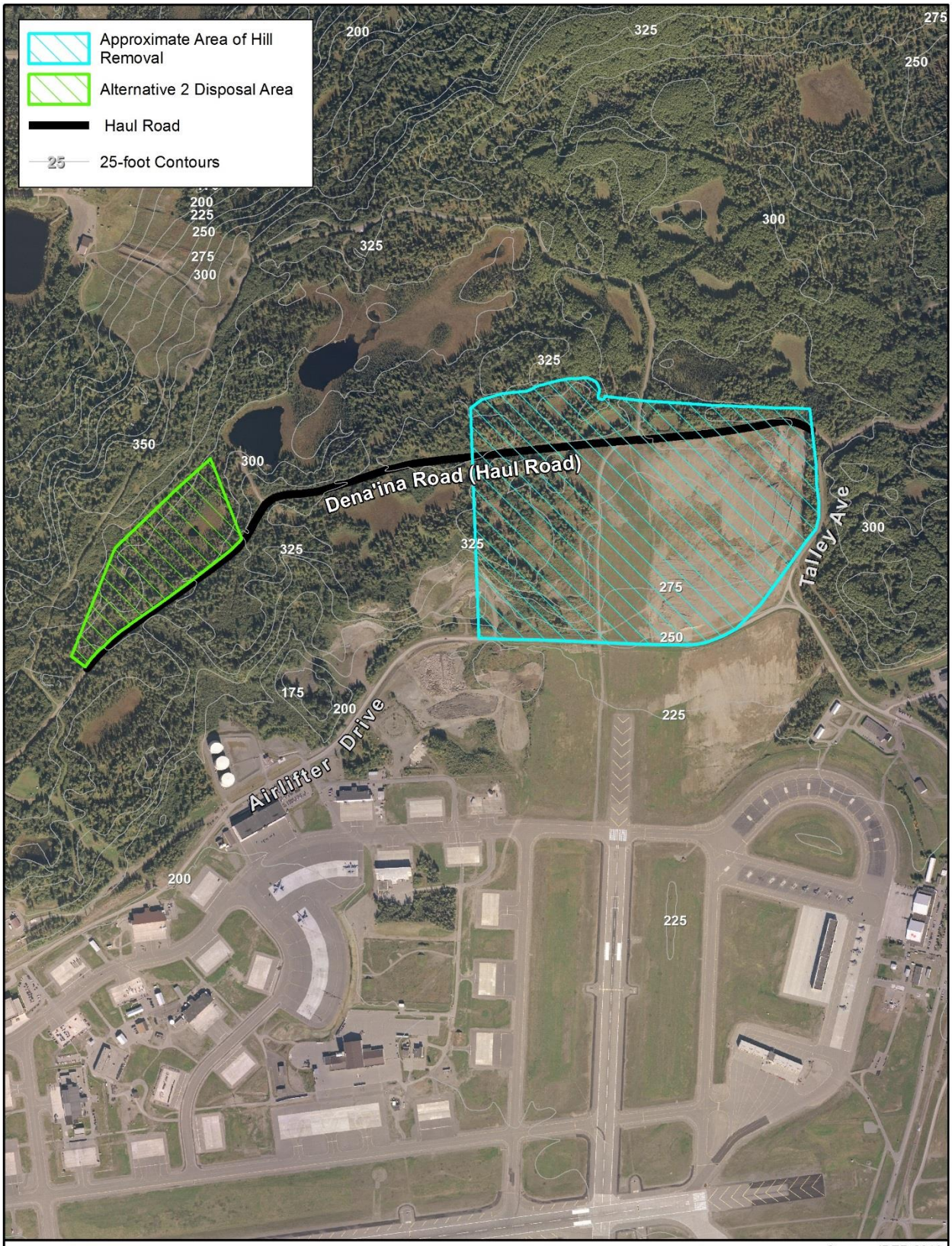

Figure 2-2: Location of the Project Area

Source: JBER 2016. GCS_1984_UTM_Zone_6N. AlaskaMapped Imagery.

Material extraction procedures and equipment are anticipated to remain the same as identified in Section 2.1.

Equipment used during excavation would include front end loaders, excavators, tractor-mounted bulldozers, water distributors, fuel trucks, pump systems with generators, flood lights, dump trucks, and/or scrapers. Best Management Practices (BMPs) would be implemented while hauling and disposing of material.

Topsoil at the disposal site would be saved in accordance to guidance from the U.S. Fish and Wildlife Service. Once the disposal site is closed, topsoil will be spread out to encourage regrowth.

This disposal site has a capacity exceeding 1.6 million cy and is suitable for disposal of the excavated material. This alternative will be carried forward for environmental analysis in the subsequent sections. Future reference to this alternative will be as Alternative 2.

2.6.2 No Action Alternative

There are currently no available disposal sites for excavation operations to continue. The No Action Alternative is carried out for further environmental analysis as required under CEQ regulations. The No Action Alternative will be referred to as Alternative 1 throughout the rest of the EA.

2.7 Scope of Resource Analysis

The Proposed Action and alternatives have the potential to affect certain environmental resources. These potentially affected resources have been identified though communications with State and Federal agencies, Alaska Natives review of past documentation, and public input. Specific environmental resources that have the potential to be affected include Aesthetics/ Visual Resources, Land Use/Air Installation Compatible Use Zones (AICUZ), Acoustic Environment, Air Quality, Water Resources, Safety and Occupational Health, Hazardous Materials/Waste, Biological Resources, Cultural Resources, Earth Resources (Soil), and Transportation.

3 Affected Environment

This chapter provides a description of resources that may be affected by the Proposed Action. Resource areas evaluated in the EA include environmental and social topics. Specific topics include compatible land use in Air Installation Compatible Use Zones (AICUZ) classified as accident potential zones (APZs) and noise zones, air quality, water, public health and safety, hazardous waste and materials, aesthetics, cultural, transportation, geology, soils, wildlife, vegetation, wetlands, and socioeconomic resources. Each environmental resource discussion begins with an explanation of what the resource consists of, and the potential geographic scope of any potential consequences. For each resource, the area of potential effect (APE) includes portions of JBER that include the excavation and disposal site, as well as the surrounding areas of influence. For example, soils are evaluated locally, while air quality and noise analyses extend further from the site, as needed to characterize the influence that actions at JBER may have on the surrounding area.

NEPA documents usually contain a section that describes environmental justice communities and addresses potential effects to such communities. In this instance, it was determined that there are no environmental justice communities in the vicinity of the project area, and such communities located in the region would not be affected by the proposed project. Therefore, environmental justice is not analyzed in this EA.

3.1 Aesthetics / Visual Resources

This project area's visual resources include the proposed disposal site's local characteristics, the excavation area and associated haul routes, and long-range views outward from the site. Viewer groups include JBER personnel or visitors.

JBER is located north of Anchorage between the Chugach Mountains and Cook Inlet, an area of natural beauty that has been altered through human settlement and industry. Views within the project area are dominated by the military industrial uses of JBER, including asphalt aircraft runways, connecting paved and unpaved roadways, military style hangers and support buildings. Vegetation within the active air base is sparse and ruderal with pockets of shrubs or trees. Long-range views outward from the base include forested foothills and snowy peaks of the Pacific Border Ranges province and gently undulating moraine fields of the Coastal Trough physiographic province, which hosts the Elmendorf Moraine.

The excavation area is located on the North Hill, east of the disposal area, and it has been substantially altered by past excavation. Excavation is intended to lower North Hill by up to 30 feet from its current elevation, which is already lower than its original elevation. Forest and shrub habitat formerly covered this area, but this study area's existing conditions include a highly disturbed hillside. Ongoing excavation has prevented most vegetation from returning to this area.

3.2 Air Installation Compatible Use Zone (AICUZ)/Land Use/Acoustic Environment

This section describes the physical human environment that may be affected by the Proposed Action, including land uses, AICUZ, the acoustic environment, hazardous materials, and health and safety.

3.2.1 Land Use

Land uses are correlated to the AICUZ compatible land use guidance defined by the DoD. The land use study area includes all lands at JBER surrounding the project area. Since lands outside of JBER would not be affected by the proposed project, they are not included in the land use analysis.

The Installation Development Plan (IDP) is the primary land use and planning document for JBER, and was adopted by the base in 2015 (USAF 2015b). The IDP identifies 12 distinct land use categories, in addition to aquatic areas (Figure 3-1). Land use at JBER is dominated by the large airfields and attendant facilities. These facilities are generally located in the center of the base, with industrial uses dominating the perimeter of the airfield area. The IDP identifies large areas dedicated to training in the northern, eastern, and southern portions of the base, and open space dominates the western portion of the base.

The proposed disposal area is in a land use category identified as Open Space/Buffer Zone, and it is found in proximity to areas identified as Outdoor Recreation and Industrial. The excavation area is found in both Industrial and Open Space areas. It is directly adjacent to the Airfield Pavement Zone, which is proposed to be expanded under future land use planning to include the excavation area and additional open space north of the excavation area. Under proposed future land use plans, the area that includes the disposal area would remain as open space (USAF 2015b).

3.2.2 Recreation

Much of the area near the excavation and disposal areas is categorized as open space and is available to base personnel for recreational uses. These uses may include hiking, running, bicycling, bird watching, cross-country skiing, and use of all-terrain vehicles or snowmobiles at appropriate times of the year. Both Fish and Triangle Lakes are stocked with rainbow trout and are used for fishing by base personnel and their families. The immediate area including the excavation and disposal sites is heavily disturbed, and it experiences heavy truck traffic due to ongoing excavation, therefore its recreational use is minimal.

3.2.3 AICUZ

The purpose of the AICUZ program is to promote compatible land development on- and off-base in areas subject to aircraft noise and accident potential. JBER's AICUZ study (USAF 2006) identifies zones affected by aircraft noise, accident potential, and structure height restrictions. Within these zones, base operations are limited by the need to minimize noise in neighboring areas and ensure public health and safety. To address existing incompatibilities, actions are implemented to limit the hours of air operations, adjust flight patterns, and modify runway approach angles. AICUZ noise contours identify areas where noise levels regularly exceed 65 decibels (dB), and thus are incompatible with residential land uses (Figure 3-2). These areas include and extend north of the excavation area, south of the main gates into the City of Anchorage, east into the training area, and west over Cook Inlet (Figure 3-2). The AICUZ study also identifies environmental concerns, areas where the height of ground structures must be restricted in order to ensure that the flight path is unobstructed, and sections of the flight path where there is greater potential for aircraft accidents to occur (see Section 3.5). Areas with elevated potential for aircraft accidents, referred to as APZs, were identified based on statistical analysis of past DoD aircraft accidents (USAF 2015b) (Figure 3-3). APZs are relevant to this study because the current topography of the hill north of Runway 16/34 elevates the risk of accidents and makes it an APZ.

Figure 3-1: Land Use

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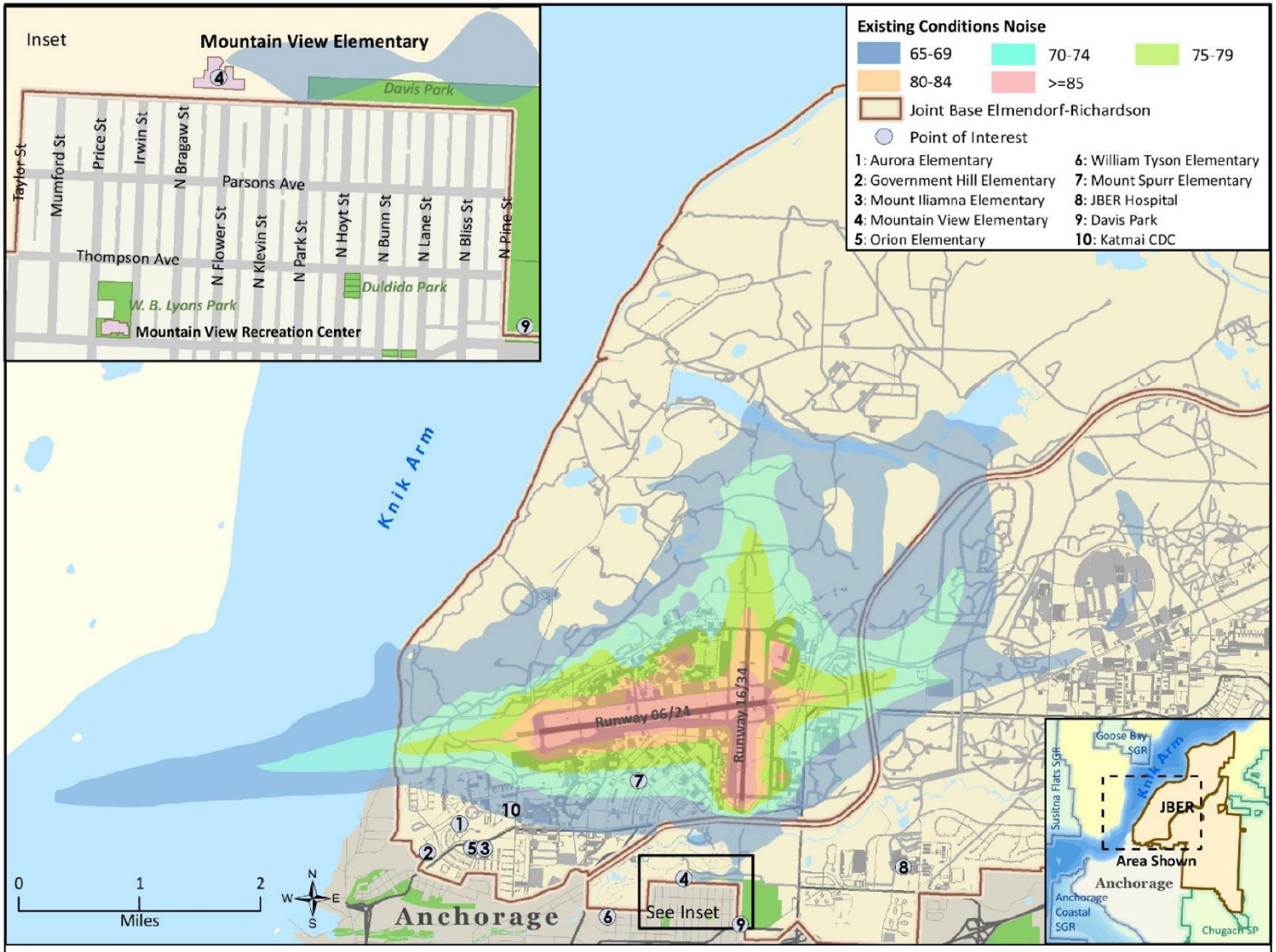

Figure 3-2: Runway Noise Contours, Average Sound Levels

Source: JBER 2016, ESRI. GCS_1984_UTM_6N. AlaskaMapped Imagery.

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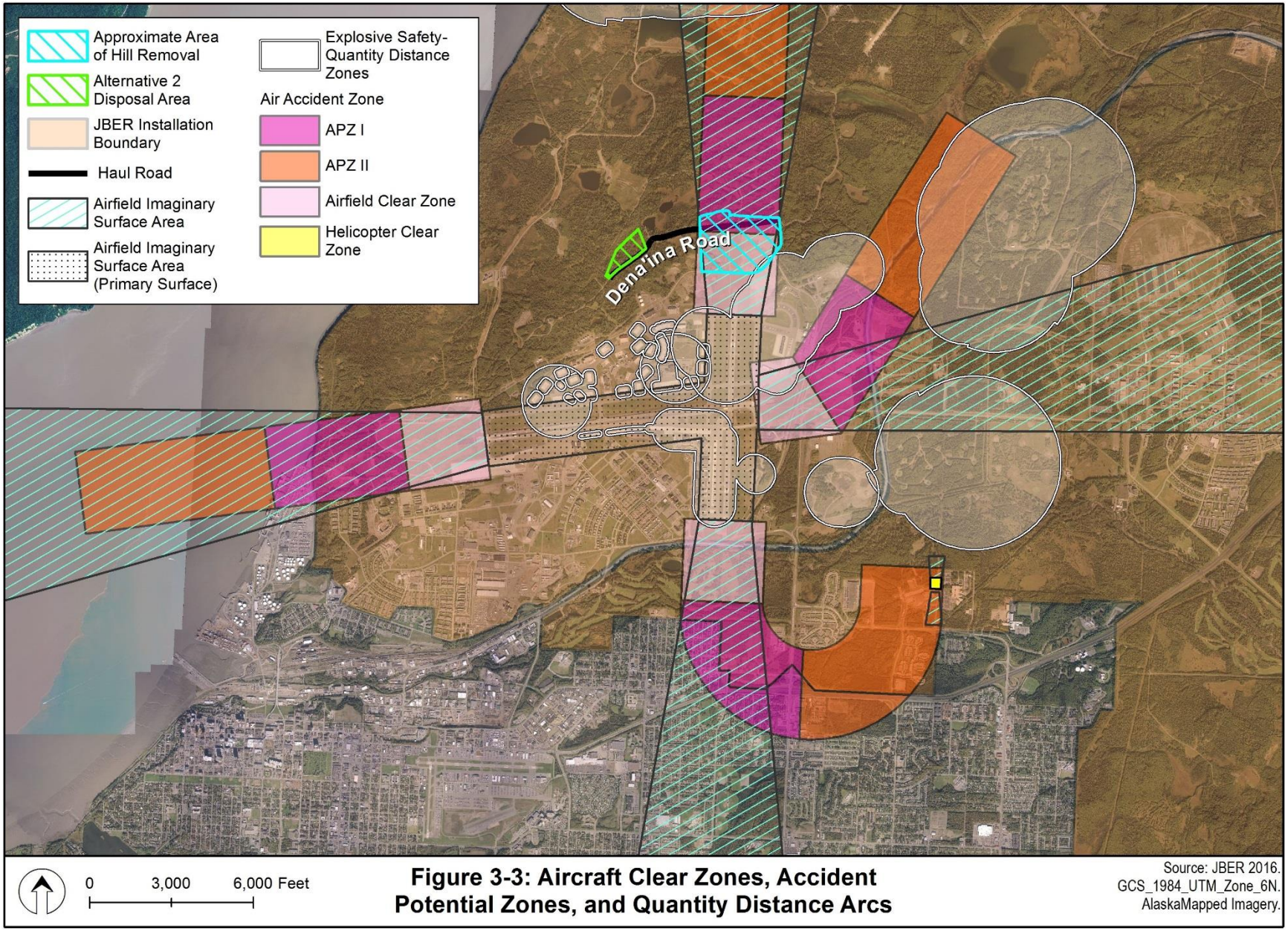

Figure 3-3: Aircraft Clear Zones, Accident Potential Zones, and Quantity Distance Arcs

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3.2.4 Acoustic Environment

This section describes the proposed project area's acoustic conditions, including point noise sources (for example, a jet engine) and ambient noise sources (for example, background traffic noise) and the presence of sensitive receptors such as hospitals, schools, libraries, and nursing homes.

Noise is the intrusion of a new sound inconsistent with and above the background level of the existing soundscape. Sound is measured in dB on a logarithmic scale. The sound levels of some common activities are shown in Table 3-1. A change in sound level of 3 dB or less is barely perceptible by the human ear, while a 10 dB increase or decrease in sound level is perceived as a doubling or halving of sound level (FHA 2016). However, to a human ear, lower frequency sounds at a given dB are not perceived to be as loud as higher frequency sounds at that same dB. To account for this, measured sound levels are often weighted according to their frequency using a system called A-weighting, which reduces the dB value of lower frequency sounds. The adjusted sound levels are reported as A-weighted decibels (dBA).

The project site begins at the north end of a military runway, and sound from aircraft take-offs and landings is a major component of the existing acoustic environment. Areas near the airfield and air operations experience sound levels equal to or greater than 65 dBA day-night average sound level (DNL) (Figure 3-2). DNL is the average noise level during a 24-hour period, with a 10 dB penalty added for flight operations that occur between 10 PM and 7 AM to account for their increased annoyance. Land use is restricted in areas with high DNL.

Table 3-1: Example Sound Levels

Sound Level (dB)	Activity
120	Plane take-off
105	Rock concert
100	Lawn mower
70-80	Traffic noise
60-65	Office
35	Library
10	Breathing
Source: Washington Department of Ecology 2016	

In addition to noise generated by aircraft, ambient noise is generated by ongoing construction and excavation near the excavation area and by JBER's general operations. Noise is generated by use of passenger vehicles and heavy trucks and from stationary sources including repair and maintenance facilities, training areas, and cantonment areas. Due to JBER's large size, most noise generated from these sources does not travel beyond the base boundaries.

As shown in Figure 3-2, the project site is inside the noise contours, indicating existing noise levels are equal to or greater than 65 dBA DNL. Baseline sound levels at the project site are approximately 69 to 76 dBA DNL in the hill removal area and approximately 65 to 69 dBA DNL in the disposal area (JBER 2016a).

Sensitive receptors, as defined by the EPA, are facilities where occupants are more susceptible to adverse noise effects than the general population. The nearest buildings are approximately 0.25 miles from the project site and are used for maintenance and administrative functions, but they are not sensitive receptors. The nearest sensitive receptor is the Mt. Spurr Elementary School, approximately 1.75 miles southwest of the project area. The nearest residences, which are not normally considered sensitive receptors, are also 1.75 miles southwest of the project site.

3.3 Air Quality

This section describes air quality in the region that includes JBER, and it identifies ongoing sources of air pollution on the base. It also provides background data for determining threshold levels of emissions and the regulations that are in place to protect air quality.

Ambient (outdoor) air quality standards exist to prevent air pollution from reaching levels harmful to public health and the environment. Ambient air quality standards are generally set at federal and state levels.

Under Sections 108 and 109 of the Clean Air Act, 42 USC §§ 7401 *et seq.*, the U.S. EPA established National Ambient Air Quality Standards (NAAQS) to protect air quality and prevent air pollution from reaching levels that are harmful to public health and the environment (EPA 2016a). Six criteria pollutants are of particular concern for human health and the environment: particulate matter measuring less than 10 microns in diameter (PM_{10}), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), and lead (Pb). Concentrations of these pollutants are measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). Table 3-2 presents the NAAQS for these principle pollutants.

The Alaska Department of Environmental Conservation (ADEC) has primary jurisdiction over air quality and regulation of emissions, and it has set air quality standards that are identical to the NAAQS. ADEC maintains a monitoring network that measures concentrations of air pollutants. If monitoring results within an area do not exceed the NAAQS, the EPA designates this area an “attainment area.”

At JBER, air emissions may by generated by ongoing practices that occur in set locations (stationary sources) or by mobile sources that may or may not be recurrent. Stationary sources may include repair facilities, food preparation facilities, hospitals, or other locations where boilers, heaters, generators, or volatile chemicals are used. Mobile sources may include construction equipment, other ground-based vehicles, trains transiting the base, and aircraft. Mobile sources in the form of heavy excavators and dump trucks have been operating in the excavation area during the spring and summer months for several years. According to ADEC (2016), JBER is designated as an “attainment area” for all six criteria pollutants. As a result, actions proposed or occurring on the base are not subject to a conformity analysis.

Table 3-2: NAAQS for Principle Pollutants

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8 hour	None
	35 ppm (40 mg/ m^3)	1 hour	None
Lead (Pb)	0.15 µg/m^3	Rolling 3-month average	Same as Primary
Nitrogen Dioxide (NO_2)	0.053 ppm (100 µg/m^3)	Annual	Same as Primary
	0.1 ppm	1 hour	NA
Particulate Matter < 10 microns in diameter (PM_{10})	Revoked	Annual	NA
	150 µg/m^3	24 hour	NA
Particulate Matter < 2.5 microns in diameter ($PM_{2.5}$)	15.0 µg/m^3	Annual	Same as Primary
	35 µg/m^3	24 hour	
Ozone (O_3)	0.08	8 hour	Same as Primary
	0.12	1 hour	Same as Primary
Sulfur Dioxide (SO_2)	0.03 ppm	Annual	NA
	0.14 ppm	24 hour	NA
	0.075 ppm	1 hour	NA
	NA	3 hour	0.5 ppm (1300 µg/m$^{3)}$

3.4 Water Resources

3.4.1 Watersheds

Most of the excavation area is located within the Ship Creek watershed. The disposal area and a small part of the northern portion of the excavation area are located in the Kettle Lakes watershed. The Ship Creek watershed is the largest watershed on JBER, and drains into Ship Creek, which flows through the installation for 13.3 miles before emptying into the Knik Arm (USAF 2016b).

The Kettle Lakes watershed is found west of the Ship Creek watershed in the Elmendorf Moraine. The Kettle Lakes region is comprised of many small depressions, most lacking a defined inlet or outlet due to their formation by large blocks of glacial outwash. These depressions typically receive melt and stormwater and release them through groundwater recharge. Excess water from snowmelt and heavy rain drains off as sheet flow (i.e., as a thin layer of flow on the surface) directly to Knik Arm.

3.4.2 Surface Water

The primary stream in the vicinity of the project area is Ship Creek, which flows through the installation south of the primary runway-cantonment area. It is located approximately 1.5 miles from the excavation area at its closest point. Discharge in this stream ranges from no discharge in some portions during the winter months to 144 cubic feet per second during the spring runoff period. There are no defined streams that drain from the excavation area or the disposal area directly into Ship Creek. Instead, sheet flow runs off into storm drains and is contained behind berms (USAF 2016b).

On JBER, there are 35 natural and man-made lakes and ponds one acre or larger in size (totaling 628.2 acres), the largest of which (Otter Lake) has a surface area of 150 acres (USAF 2016b). Sixteen of these lakes and ponds are managed for their wildlife or recreational value. There are numerous ponds on the installation less than one acre and others that are only seasonally flooded. They provide varying amounts of wildlife habitat but are not actively managed. The primary permanently ponded areas in the vicinity of the project area are Fish Lake (3.1 acres) and Triangle Lake (3.5 acres).

3.4.3 Groundwater

Two freshwater aquifers underlie most of JBER. These aquifers flow west from the Chugach Mountains to the Cook Inlet and are recharged by groundwater originating from precipitation in the mountains. The aquifers lie in different soil strata and are separated by a 60- to 200-foot layer of impermeable Bootlegger Cove Clay (USAF 2016b). The upper aquifer directly underlays the project area. The deeper, confined aquifer would not be affected by the project, so it is not discussed here.

The upper, unconfined aquifer lies in a 30-foot by 100-foot-deep layer of well-bedded and well-sorted gravel near the surface. This aquifer usually can be accessed at depths of less than 50 feet (CH2M Hill 1994). There is no apparent interconnection between the two aquifers. For the most part, groundwater movement in this shallow aquifer follows surface topography. Flow is to the northwest along the northern limb of the moraine and to the southeast along the southern limb. The groundwater divide coincides with the crest of the moraine, which is north of the project area.

3.4.4 Water Supply

Ship Creek is dammed well upstream of the main runway-cantonment area to form a 2.8-acre reservoir. This reservoir provides all of the potable water for JBER, as well as some for the Municipality of Anchorage. JBER also has several backup water wells fed by a shallow aquifer along Ship Creek. These wells are intended to provide a backup water supply in the event that supplies from Ship Creek reservoir are not available.

3.4.5 Water Quality

The base maintains compliance with its National Pollution Discharge Elimination System Multi-Sector General Permit for protection of surface water by non-point sources. Groundwater monitoring on JBER indicates that industrial activities associated with JBER have resulted in minor and localized pollution to the shallow aquifer. Contamination has occurred where there was leakage from underground storage tanks and facilities where chemicals were stored and where chemicals were dumped. These areas are being monitored intensively, and there has been no indication of deep groundwater pollution. There has been no significant risk to human health.

Water quality in the project area is addressed in the Airfield Obstruction North Hill Removal SWPPP (USAF 2016c). The main potential form of stormwater contamination is the transport of suspended sediments, which occurs when runoff from rain and snowmelt travels over disturbed surfaces. Additional potential pollutants such as petroleum products, solid wastes, and solvents are associated with construction vehicles. The SWPPP establishes BMPs to maintain water quality and indicates that no runoff from the site would reach waters of the U.S.

3.5 Safety and Occupational Health

This section describes the known or potential health and safety hazards that occur within the proposed project area, as well as the guidance for maintaining safe conditions.

Title 14 CFR §77 requires notifying the FAA at least 45 days prior to the start of any construction or alteration project that could be an obstruction to air navigation, whether temporary or permanent. Construction projects that require FAA notification include those within 20,000 feet of a military airport with at least one runway more than 3,200 feet where the height of construction would exceed a ratio of 1 vertical foot for every 100 horizontal feet from the runway's end. The project proponent for such projects should notify the FAA using FAA Form 7460-1, Notice of Proposed Construction or Alteration. The notification must include pertinent information about the project and appropriate attachments showing the type and location of the project. FAA Form 7460-2, Supplemental Notice, is used to notify the FAA of progress on or abandonment of projects requiring notice using FAA Form 7460-1.

Hilly terrain north of Runway 16/34 obstructs the optimal flight path for arriving and departing aircraft. The runway does not meet UFC 3-260-1 approach-departure surfaces criteria. To conduct runway operations, the USAF is required to implement waivers to both the FAA and USAF flight safety regulations. The waivers are granted on a temporary basis and require that actions be taken to mitigate the danger until the hazard can be corrected.

Airfield clear zones and APZs are established around airfields to identify areas with relatively high potential for an accident involving aircraft operations. The clear zone is at the immediate end of the runway; no buildings are allowed in the clear zone. APZ I and II, respectively, are beyond the clear zone. There is still an elevated risk of an aircraft accident in the APZs; however, the risk diminishes from APZ I to APZ II. Clear zones and APZs near the project site are shown in Figure 3-3. Most of the hill removal area is in the airfield clear zone; the northern-most portion is in APZ I. The disposal area is not in the clear zone or an APZ (JBER 2016a).

Quantity-distance (QD) arcs are defined areas around explosive material storage that could be affected in an emergency. As shown in Figure 3-3, except for the southeastern tip of the project site, which lies just inside the edge of a QD arc, the project site is not in a QD arc.

Wildlife strike hazards constitute a safety concern because they can result in damage to aircraft or injury to aircrews or local human populations if an aircraft crashes. Migratory waterfowl (such as ducks, geese, and swans) and raptors (such as eagles and osprey) are the most hazardous birds to low-flying aircraft because of their size, their propensity to migrate in large flocks, or because they slowly soar while hunting. In Alaska, peak migration periods for waterfowl and raptors are from August to October and from April to May, periods which overlap with the proposed excavation period. JBER has developed detailed procedures to monitor and react to heightened risk of bird-strikes (Elmendorf AFB 2012). When risk increases, limits are placed on low altitude flight and some training types. Birds may be attracted to the deposition area as it contains wetlands and thus offers forage opportunities. Birds are also known to nest in the trees around the excavation and deposition areas.

The project area is generally undeveloped and contains open water, so risks to those accessing the site include slips, trips and falls; exposure to the elements (e.g., heat and cold); interaction with wildlife such as from mosquitoes, bees, or bears; and water-related accidents such as drowning. The project site's emergency response services are provided by on-base entities; 673 ABW Safety Office provides law enforcement, 673 ABW Civil Engineering Squadron / Fire Department provides fire service, and 673 ABW Medical Group provides medical services (Walker 2016).

3.6 Hazardous Materials / Waste

This section describes the types of hazardous or toxic substances that may be present in the project area, including those known to exist or that have the potential to exist in the excavation or disposal sites, or the areas that may be affected during the Proposed Action.

Activities involving hazardous and toxic substances at JBER are primarily regulated by the EPA, the U.S. Occupational Safety and Health Administration, the U.S. Department of Transportation, and ADEC. The staff of JBER's Environmental Program oversees compliance with applicable regulations.

Mission-supporting operations at JBER involve the use, storage, and handling of hazardous substances and petroleum products and the generation, storage, transport, and disposal of hazardous and petroleum waste. Examples of hazardous substances and petroleum products used at JBER include fuels, oils, lubricants, solvents, and paint. Hazardous materials and waste are managed in accordance with applicable regulations, USAF policy and procedures, and the JBER OPLAN 19-3 Environmental Management Plan (EMP) (USAF 2016d).

Hazardous materials other than fuel for construction vehicles are not stored at the project site, and hazardous waste is not generated there. As shown in Figure 3-4, contamination has been found in one area within the project site. In 2004, an excavator operator noticed an odor in the soil during excavation activities at the North End Borrow Pit. As a result, approximately 160 cy of soil from trucks that were hauling the suspect material, and soil that had been recently dumped, was returned to the location of origin and placed in a stockpile. Excavation activities were moved to a different location, and no attempt was made to delineate the in-situ extent of contamination. One analytical sample was collected and analyzed for diesel range organics, which were measured at 202 milligrams per kilogram. The source of the contamination is not known (MARAD 2006).

The hill removal area is in an area mapped in the EMP as the gravel pit area (USAF 2013) (Figure 3-4). The gravel pit area has been disturbed by excavation in the past and it is possible that contamination could be found there; however, the area has not been tested (Walker 2016). There have been no recorded industrial uses of the gravel pit area, and it has not been used to store hazardous substances.

JBER investigates and manages sites with known or potential contamination under the Environmental Restoration Program and Military Munitions Response Program. As shown in Figure 3-4, several sites with known or suspected contamination are within 1 mile of the project site. The nearest site is a former explosives storage area immediately east of the excavation area that is recommended for no further action (USAF 2010, 2013). The sites within a mile of the project area include munitions sites, sites with land use controls, and groundwater plumes contaminated with fuels and solvents. Contamination at

these sites is not likely to have migrated to the project site, and no land use controls related to releases of hazardous substances are in place at the project site.

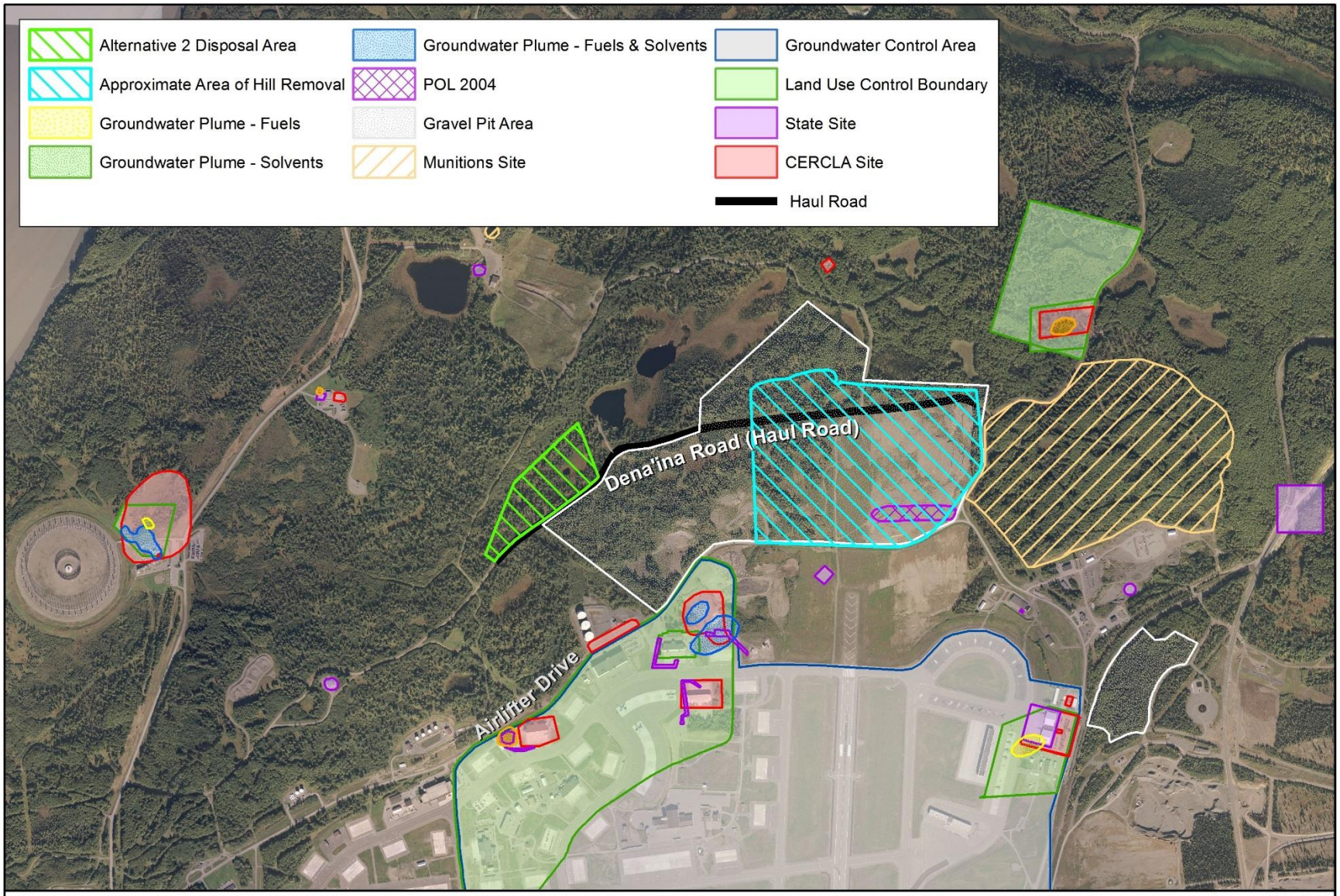

Figure 3-4: Environmental Restoration Program and Military Munitions Response Program Sites Near the Project

Source: JBER 2016. GCS_1984_UTM_Zone_6N. AlaskaMapped Imagery.

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3.7 Biological / Natural Resources

3.7.1 Vegetation Communities

According to the U.S. Geological Survey Gap Analysis Program (GAP), the disposal site hosts eight community types, which are delineated and characterized based on vegetation composition (USGS 2011). No focused site surveys were conducted to confirm these data, but a reconnaissance-level survey was completed in June 2016. Wetland delineations conducted in 2015 provide additional vegetation community information (Johnson 2015).

The most abundant community reported for the disposal site is Western North American Boreal Mesic Black Spruce Forest, followed by Western North American Boreal Mesic Birch-Aspen Forest. Smaller areas of the remaining communities are interspersed within the site. Within the project area, these communities are found within the Lowland Interior Forest Zone, which is one of 5 physiographic zones found at JBER. Various ecotypes are found within this zone, with the Upland Gravelly Moist Mixed Forest ecotype containing both of the plant communities described above (Figure 3-5). Descriptions for these ecotypes correspond to the JBER Integrated Natural Resources Management Plan (INRMP), which notes that natural vegetation in the region is a transition between the Pacific Coast, western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*) forest and interior boreal forests of white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), and aspen (*Populus spp.*) (USAF 2015b). Three other zones, including the Coastal Halophytic Zone, the Subalpine Zone, the Alpine Zone, do not occur within the project area. The fifth zone, which is the Artificially Cleared or Disturbed Area Zone, includes the excavation area but not the disposal area. Plant inventories on JBER have identified no threatened or endangered plant species or species proposed as candidates for listing (USAF 2016b). The following paragraphs describe each ecological system or vegetation community, as summarized from the GAP (USGS 2011).

Western North American Boreal Mesic Black Spruce Forest. This ecological system is common throughout upland slopes and inactive alluvial deposits. Common dominant trees include black spruce (*Picea mariana)*, typically the dominant species in mature stands, and white spruce (*P. glauca)*, which may be codominant on some sites.

Western North American Boreal Mesic Birch-Aspen Forest. This system is common on well-drained upland terrain in the boreal region of interior Alaska and widespread in the boreal transition region in south-central Alaska on well-drained upland terrain. Paper birch (*Betula papyrifera)* is most often dominant in the canopy. Other dominants or subdominants include balsam poplar (*Populus balsamifera*) and aspen (*P. tremuloides)*.

Other, less dominant communities found within the project area include:

Western North American Sub-boreal Mesic Bluejoint Meadow. This community occurs throughout the boreal and boreal transition regions where soils are typically fine-textured mineral and may be poorly drained (on flats) to well-drained (on sideslopes).

Western North American Boreal Mesic Scrub Birch-Willow Shrubland. This ecological system occurs throughout the boreal and boreal transition regions on mesic sites on mid- to upper slopes, above treeline and on flats and sideslopes.

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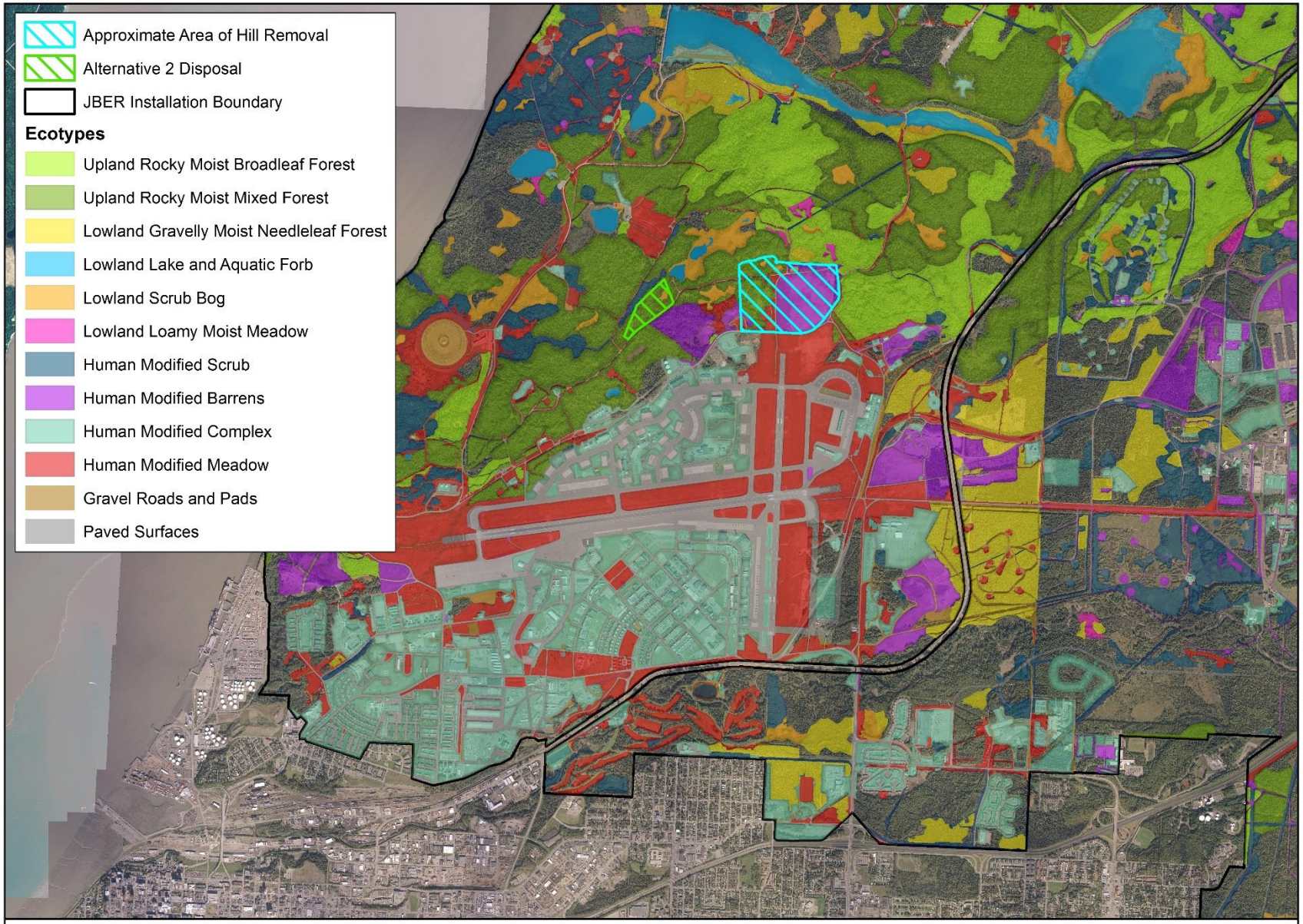

Figure 3-5: Ecotypes within the Project Vicinity

Source: JBER 2016, ESRI. GCS_1984_UTM_6N. AlaskaMapped Imagery. USAF 2016b.

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Western North American Boreal White Spruce-Hardwood Forest. This system is common on well-drained upland terrain on south, west, and east facing aspects. White spruce is dominant with paper birch and/or aspen, and these mixed stands are persistent for more than 75 years.

Alaska Sub-boreal White Spruce-Hardwood Forest. This ecological system is widespread in south-central Alaska on well-drained upland terrain, with white spruce and paper birch typically codominant in an open canopy.

Alaska Sub-boreal White-Lutz Spruce Forest and Woodland. This system occurs in boreal transition regions on well-drained upland terrain. Dominant conifers include white spruce or hybrid spruce (*P. lutzii)*, although paper birch, balsam poplar, and aspen are often present. Common shrubs include Sitka alder, rusty menziesia (*Menziesia ferruginea),* oval-leaf blueberry *(Vaccinium ovalifolium)*, devil's club (*Oplopanax horridus)*, lingonberry, and twinflower. Common herbaceous species include bluejoint grass, field horsetail, spreading woodfern, and Pacific oakfern (*Gymnocarpium dryopteris)*.

Western North American Boreal Herbaceous Fen. This system is reported to occur in the disposal site. It typically occurs in shallow depressions and basins, pond margins, and thermokarst pits. Fens are nutrient-rich and have a thick peat layer that may be floating or submerged, and standing water is usually present. Recent jurisdictional wetland determinations did not categorize wetlands into GAP ecological systems, although a floating mat system was reported to be present at Wetland 3 within the disposal site (Johnson 2015).

In contrast to the unmanaged disposal site, the excavation area is a patchwork of highly disturbed vegetation and native shrub or forest (Figure 3-5). Vegetation types range from mature birch/spruce forest to middle-aged closed canopy Sitka alder to grass meadows and black spruce bogs (MARAD, 2006). Understory species include willow (*Salix* spp.), elderberry (*Sambucus* spp.), rusty menzeiseia, devil's club, and sapling cottonwood (*Populus* spp.) (MARAD 2006). Native forest, shrub, meadow, and wetland vegetation communities are similar to those described for the disposal site. However, due to the disturbance of the site, native communities are likely only present in small areas and interspersed with early succession regrowth. Vegetation regrowth in borrow areas includes grasses, sedges and forbs, particularly bluejoint grass and pioneering Scouler's willow (*S. scouleriana*).

3.7.2 Wetlands

Wetland delineations of surrounding areas were conducted in 2014 and 2015 and included the proposed disposal site, north of Dena'ina Road (Johnson 2015) (Appendix D). Based on existing JBER wetland inventory mapping and physical site surveys, three wetlands were found within the disposal area; Wetland 1 at 0.05 acres, Wetland 2 at 0.025 acres, and Wetland 3 at 8.5 acres (Figure 3-6). Wetlands were also identified in the proposed excavation area, and are described below. The following wetland descriptions are summarized from Johnson (2015).

All three wetlands found at the disposal site were depressional palustrine emergent or scrub-shrub/forested, found within a landscape of highly variable topography, characteristic of the Elmendorf Moraine. Dominant species at the site, in both wetlands and uplands, included bluejoint grass, Alaska birch (*Betula neoalaskana* var *papyrifera)*, and gray alder (*Alnus incana)*. Upland plots commonly contain prickly rose and fireweed. Wetlands plots often had beachhead iris (*Iris setosa)*, ostrich fern (*Matteuccia struthiopteris)*, and/or purple marshlocks.

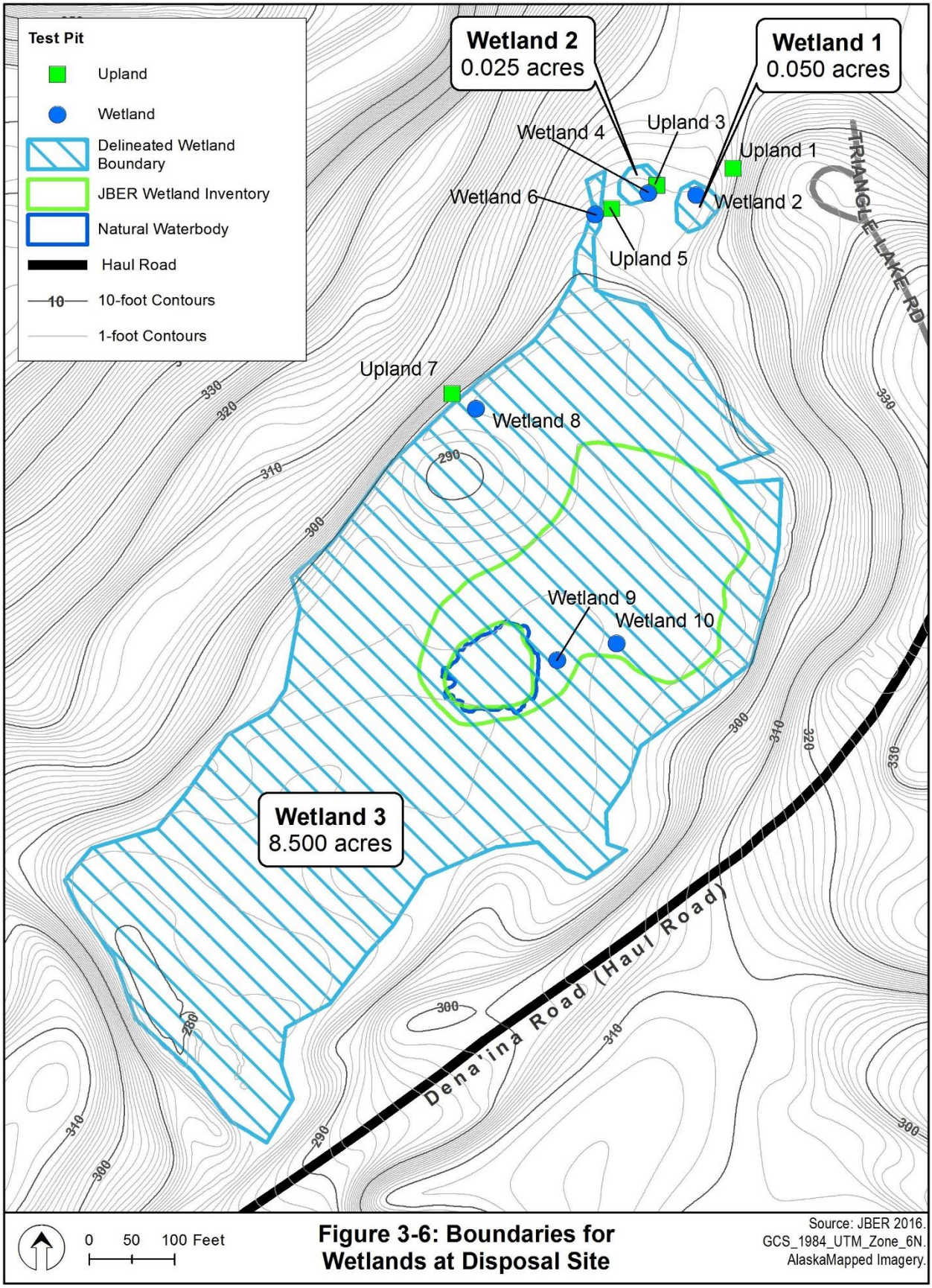

Figure 3-6: Boundaries for Wetlands at Disposal Site

Soils at Wetlands 1 and 2 showed faint to modestly prominent oxidized root channels and reduced features (mottles) below the organic surface soil horizon. This indicates that these areas are likely only seasonally saturated with no apparent standing water. Soils at Wetland 3 were supersaturated, richly-blackened, organic soils with some loamy texture mixed into lower horizons, overlaid on coarse rock till. This wetland is a complex of mixed forested/shrub carr (or swamp) edge, stunted spruce forested/ericaceous (plants that require acidic soils) shrub carr established on a floating mat, with an open water pond inclusion (Johnson 2015). Table 3-3 shows wetland types according to Cowardin classification (Cowardin 1979). At Wetland 3, wetland types were determined at each wetland sample pit; the intermixed wetland types indicates a complex system with varying characteristics.

Table 3-3: Classification of Wetlands at the Disposal Site

Wetland	Acres	Cowardin Classification	Descriptions
1	0.05	PEM2C	(PEM) Palustrine Emergent (2) Non-persistent (C) Seasonally flooded
2	0.025	PEM2C	(PEM) Palustrine Emergent (2) Non-persistent (C) Seasonally flooded
3	8.5	PEM1B/C	(PEM) Palustrine Emergent (1) Persistent (B) Seasonally saturated (C) Seasonally flooded
		PSS1	(PSS) Palustrine Scrub-Shrub (1) Broad-leaved deciduous shrubs
		PSS1B/C	(PSS) Palustrine Scrub-Shrub (1) Broad-leaved deciduous (B) Seasonally saturated (C) Seasonally flooded
		PSS1E	(PSS) Palustrine Scrub-Shrub (1) Broad-leaved deciduous (E) Seasonally flooded/saturated
		PAB4H0	(PAB) Palustrine Aquatic Bed (4) Floating vascular plants (H) Permanently flooded (0) Freshwater
		PFO4Bg	(PFO) Palustrine Forested (4) Needle-leaved evergreen (B) Seasonally saturated (g) organic soils
Source: Johnson 2015			

Jurisdictional determination of the wetlands in the disposal area was made by evaluating the connection between Wetlands 1, 2, and 3 with nearby Waters of the U.S. at Triangle Lake and Fish Lake. Each are small rainbow trout ponds located east of Wetlands 1, 2 and 3. Triangle and Fish Lakes are connected by a wetland comprised of a floating mat system, indicating a significant hydrologic connection between the two lakes. However, Wetlands 1, 2 and 3 are separated from Triangle Lake by steep topography, have no defined inlet or outlet, and therefore do not appear to be hydrologically connected to Triangle or Fish Lakes. Furthermore, there are no apparent connections of the wetlands to Cook Inlet tidal waters (approximately 1.25 miles west). As a result, the disposal area wetlands were found to be non-jurisdictional (USACE 2015). Subsurface soil properties were reported to include coarse, gravelly, moraine, which may result in a subsurface hydrological connection between wetlands in the study area and neighboring Triangle and Fish Lakes.

Wetlands within the excavation site were evaluated in 2014 and summarized in a subsequent 2015 letter from the USACE Regulatory Division (USACE 2015). Wetlands W1, W2-1, W2-2, W3, and W4 totaled 8.74 acres (Figure 3-7). Wetland plots contained the following vegetation: Northern water-plantain (*Alisma trivale*), fowl blue grass (*Poa palustris*), water sedge, purple marshlocks, swollen beaked sedge (*Carex rostrata*), bluejoint, arctic blue grass (*Poa arctica*), tall scouring-rush (*Equisetum hyemale*), an unknown sedge (*Carex spp*.), paper birch, gray alder, diamond-leaf willow, white spruce, slender wild rye (*Elymus trachycaulus*), and leatherleaf (*Chamaedaphne calyculata*) (USACE 2015). Wetland plot soils

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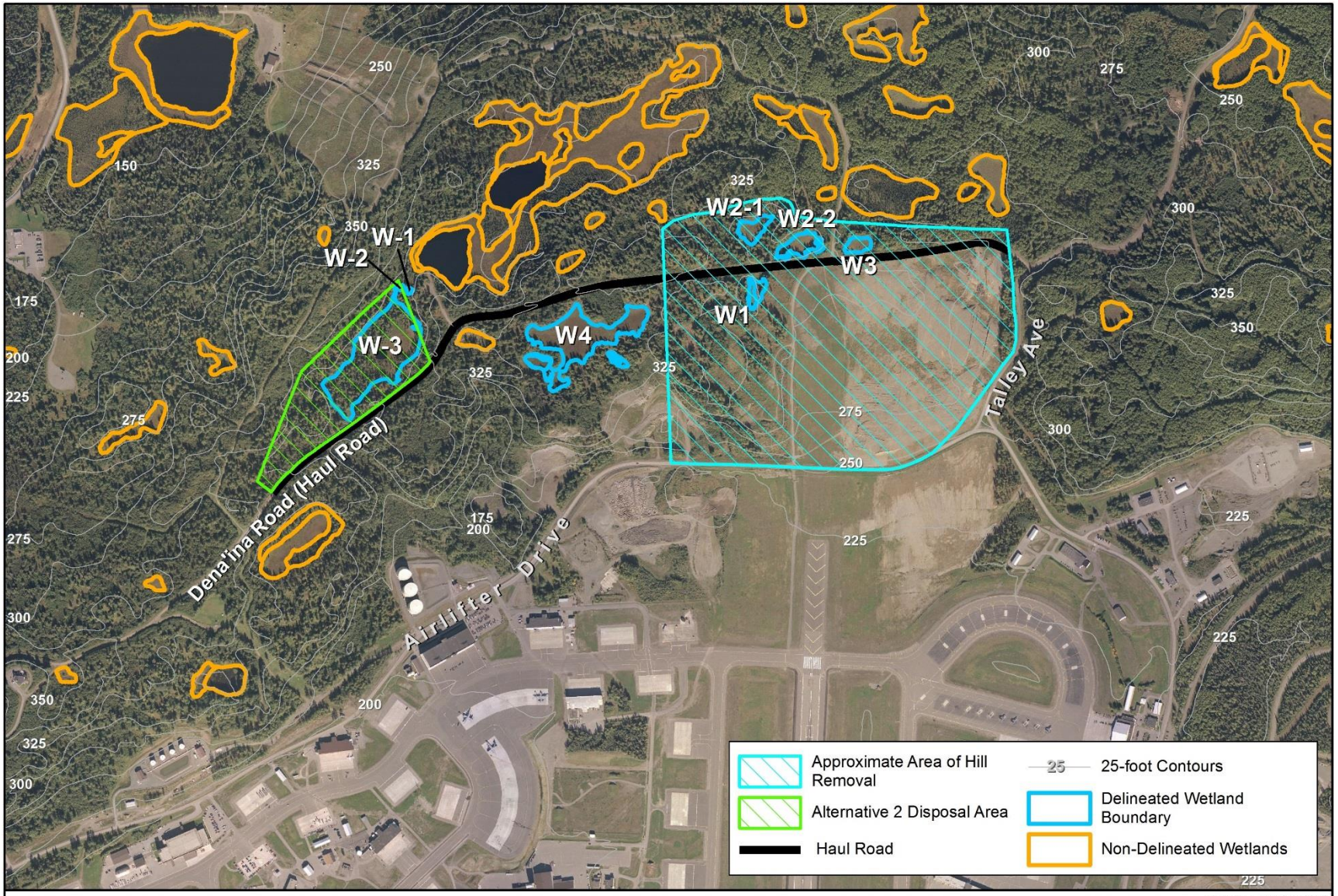

Figure 3-7: Wetlands in the Project Vicinity

Source: JBER 2016. GCS_1984_UTM_Zone_6N. AlaskaMapped Imagery.

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were low chroma and mucky or loamy. Wetland hydrology indicators included surface water, high water table, saturation, water marks, sediment deposits, and drift deposits. These wetlands were determined to be geographically, ecologically, and hydrologically isolated from jurisdictional waters of the U.S. and therefore, non-jurisdictional (USACE 2015).

3.7.3 Wildlife

This section discusses fish and wildlife species that are present or have the potential to be present in the study area. General taxa considered include fish, amphibians, birds, and mammals that commonly occur in the habitats within or near the hill removal and disposal areas. No native reptiles are found in south-central Alaska. Federally protected species that are threatened, endangered or a candidate for listing that occur in the region are discussed, along with their potential for occurrence within the project area. The attributes and quality of available habitat determine the composition, diversity, and abundance of wildlife. Additional context for this section is presented in Sections 3.7.1, *Vegetation Communities,* and 3.7.2, *Wetlands*, which provide a discussion of habitats found in the study area.

The habitat at JBER supports a diverse array of wildlife species, including large and small mammals, raptors, waterfowl, and songbirds, as well as one amphibian and 10 fish species, including the five Pacific salmon species (USAF 2016b). Although many of these species are found in the study area, the general lack of aquatic resources other than kettle wetlands, which form in steep-sided depressions left by glacial retreat, preclude the presence of fish. Under current conditions, habitat within the study area is disturbed by surrounding access roads, close proximity to the airfield and a gravel extraction site, and by human presence. These disturbances limit the assemblages and densities of wildlife that use the area, and favor species with greater capacity for human alterations and activities.

At least 112 bird species are known to occur or have the potential to occur at JBER (USAF 2016b). Waterfowl and shorebirds use the ponds, bogs, wetlands, and coastal marshes in summer and during spring and fall migration. Thirty-three species of resident and migrant land birds have been documented using forest and shrub habitats during fall season (USAF 2016b). In upland forests are raptors, which include osprey (*Pandion haliaetus*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*B. lagopus*), sharp-shinned hawk (*Accipiter striatus*), northern goshawk (*A. gentils*), merlin (*Falco columbarius*), northern harrier (*Circus cyaneus*), northern saw-whet owl (*Aegolius acadius*), boreal owl (*A. funereus*), and great horned owl (*Bubo virginianus*). Bald eagles (*Haliaeetus leucocephalus*) also reside on the base. Common breeding birds include alder flycatcher (*Empidonax alnorum*), boreal chickadee (*Poecile hudsonica*), black-capped chickadee (*P. atricapillus*), gray jay (*Perisoreus canadensis*), Swainson's thrush (*Catharus ustulatus*), myrtle warbler (*Dendroica coronata*), American robin (*Turdus migraterius*), slate-colored junco (*Junco hyemalis*), ruby-crowned kinglet (*Regulus calendula*), rusty blackbird (*Euphagus carolinus*), and white-winged crossbill (*Loxia leucoptera*) (USAF 2016b). The mix of habitat features present in the study area, including forest, ponds, and patches of woody shrubs, indicates a diversity of bird species would likely use the site at some time of the year. Birds can be found during all seasons but are likely to be at their highest densities during migration and breeding seasons. In general, the study area's bird breeding season occurs from May 1 to mid-July, and migration would occur both prior and following this period (Air Force 2016b). Owls and raptors breeding in the area would have a protracted breeding period that extends from mid-April to mid-August (USAF 2016b).

The JBER INRMP (2016b) identifies key and managed species on the installation. Key species are those that perform a disproportionately large role in ecosystem structure, while managed species are chosen

based on human values rather than ecosystem values. On JBER, gray wolves (*Canis lupus*) are key species for all but human-modified habitats, and moose (*Alces alces*) are a managed species for these habitats (USAF 2016b). Moose are more likely than wolves to be present in or near the project area, therefore they are discussed in greater detail. Moose generally favor habitats in early seral stages, with willow, aspen, birch, and cottonwood, in that order. Moose habitat is limited in the project area. Between 20 and 70 moose are estimated by Alaska Department of Fish and Game (ADFG) to live on JBER, depending on the time of year, as portions of the herd migrate off base in fall and winter. These numbers indicate that in general, the terrestrial habitats in the boreal forest ecosystem on JBER are healthy.

More frequent brown bear (*Ursus arctos*) sightings on JBER suggest a possible increase in the local population that is likely due to improved salmon runs in the area. Brown bears, at 20 to 30 percent of the density of black bears (*Ursus americanus*), move from den sites in higher elevations in the Chugach Mountains to JBER to feed on many of the same foods as black bears. The outwash plain east of the runway, found between the north Elmendorf Six-Mile Creek area, the Ship Creek riparian ecosystem, and the associated underpass of the Glenn Highway, serves as an important corridor for wildlife. An ongoing brown bear study has highlighted the importance of this corridor for brown bear movement, however, inadequate buffer widths may discourage use by wildlife, creating "dead-end" effects for wildlife moving down the Ship Creek riparian zone (Farley 2008). This area is located well out of the study area.

In addition to moose and brown bear, black bear and wolves are prevalent on JBER and use the same corridor for movement as brown bears. These species have large home ranges that also include the neighboring Chugach State Park. Black bear are resident in the area and have records of denning on JBER in the winter. Wolf packs roam the lands in and around JBER but are generally restricted to the area along the Elmendorf Moraine where they only occasionally travel and hunt. Coyote (*Canis latrans*) and red fox (*Vulpes vulpes*) are common, and lynx (*Lynx canadensis*) occur during cyclic peaks in south-central Alaska populations. JBER supports populations of small mammals including beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), porcupine (*Erethizon dorsatum*), red squirrel (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus americanus*), river otter (*Lutra canadensis*), short-tailed weasel (*Mustela erminea*), and mink (*M. vison*).

The wood frog (*Rana sylvatica*) may be present in the study area. Auditory population estimates have indicated that wood frogs are likely present in small numbers near the proposed project area, where they would be found in wetlands during breeding and tadpole periods, depending on water depth and local temperatures (USAF 2016b). The breeding period ranges from April 1 to May 25. At other times of the year, they disperse to surrounding woodlands. Young emerge and disperse from wetlands between late-July and mid-August (USAF 2016b).

Fish Lake and Triangle Lake are located just north of the project area. Both are stocked with rainbow trout (*Oncorhynchus mykiss*) by the ADFG.

3.7.4 Special-status species

Special-status species are defined as those animal and plant species listed as endangered, threatened, or candidate by the U.S. Fish and Wildlife Service (USFWS) or the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS), as well as species listed as

endangered by the state of Alaska and managed by ADFG. The Federal ESA protects federally listed threatened and endangered plant and animal species. Candidate species are species that USFWS is considering for listing as threatened or endangered but for which a proposed rule has not yet been developed. The USFWS encourages federal agencies to consider candidate species in their planning process because they may be listed in the future and, more importantly, because current actions may prevent future listing. For the State of Alaska, ADFG is responsible for determining and maintaining a list of endangered species under Alaska Statute 16.20.190. A species or subspecies of fish or wildlife is considered endangered when the Commissioner of ADFG determines that its numbers have decreased to such an extent as to indicate that its continued existence is threatened.

Current special-status species lists were obtained from USFWS (2016b) and from ADFG (2016) and were combined and are presented in Table 3-4 below. Because habitat for anadromous and/or nearshore fish species is not present in the study area, and there is no Essential Fish Habitat, NOAA-NMFS was not consulted. Of the 15 federally- and/or state-listed threatened or endangered species identified in these lists as potentially occurring in the study area, none are likely to be present (Table 3-4). The primary reason for their absence is either the lack of supporting habitat features available in the study area and/or populations being locally extinct.

Table 3-4: Special-Status Species

Species/Listing Name	Listing Status (Federal/State)	Likelihood of Occurrence
Albatross, short-tailed (*Phoebastria* (=*Diomedea*) *albatrus*)	E/E	Not present
Bear, polar (*Ursus maritimus*)	T/NA	Not present
Bison, wood (*Bison athabascae*)	T/NA	Not present
Curlew, Eskimo (*Numenius borealis*)	NA/E	Not present
Eider, spectacled (*Somateria fischeri*)	T/NA	Not present
Eider, Steller's AK breeding pop. (*Polysticta stelleri*)	T/NA	Not present
Otter, Northern Sea Southwest Alaska DPS (*Enhydra lutris kenyoni*)	T/NA	Not present
Sea lion, Steller Western DPS (*Eumetopias jubatus*)	E/NA	Not present
Whale, beluga Cook Inlet DPS (*Delphinapterus leucas*)	E/NA	Not present
Whale, blue (*Balaenoptera musculus*)	E/E	Not present
Whale, bowhead (*Balaena mysticetus*)	E/NA	Not present
Whale, humpback (*Megaptera novaeangliae*)	NA/E	Not present
Whale, right (*Eubalaena glacialis*)	NA/E	Not present
Whale, sperm (*Physeter catodon* (=*macrocephalus*))	E/NA	Not present
Fern, Aleutian shield (*Polystichum aleuticum*)	E/NA	Not present
E = Endangered, T = Threatened, NA = Not applicable		

The Migratory Bird Treaty Act of 1918 (MBTA), 16 USC. 703-711, last amended in December 1989, is a federal law that enforces international conventions to protect migratory birds. This act also prohibits disturbing a nest once it is established and until it is abandoned. This means that a nesting bird, even if it is a nuisance, typically cannot be disturbed until the nest is vacated. This law includes essentially all species of birds, not just those typically considered migratory (EO 13186). The MBTA would provide protection to almost all bird species found in the study area, including migrants and breeding birds. Exceptions would include large birds attracted to wetland areas near runways, which raise the potential for airplane-strikes. These birds, including waterfowl, cranes, waders, and raptors, are legally hazed from these areas under the USAF Bird Aircraft Strike Hazard program to decrease the safety risk (Elmendorf AFB 2003).

The Bald and Golden Eagle Protection Act (16 USC. 668-668c) makes it illegal to import, export, or take bald or golden eagles, or to sell, purchase, or barter their parts or products made from them, including their nests or eggs. Bald eagles may be present in the study area at times but are not known to nest within its borders (Craig 2016). Golden eagles (*Aquila chrysaetos*) are not known to the area.

3.8 Cultural Resources

The earliest evidence of human occupation along the Cook Inlet comes from Beluga Point site, dated at 8,000 to 10,000 years before present (Reger 1977). Habitation in the area has continued since that time. Rectangular house depressions, cache pits, and fire-cracked rock from late prehistoric Athabaskan sites are the most abundant prehistoric site type found in the Cook Inlet region, and they are associated with Dena'ina Athabaskans (McMahan et al. 1991, Workman 1980 in USAF 2016e). Athabaskan groups that moved into the area 1,500 to 2,000 years ago were replaced by local Eskimo groups that moved into the region 750 to 1,000 years ago (Kari 1988 in USAF 2016e). The Anchorage area was home to several village sites prior to the arrival of Russian and Euro-American settlers, which began with the arrival of Russian fur traders in the early 1700s and continued with the voyages of Bering and Cook in the late 1700s (USAF 2016e). After the United States purchased Alaska from Russia in 1867, development expanded, and the next big events to influence the region were the Circle City (1893) and Klondike (1896) gold rushes. Cook Inlet communities, particularly the Dena'ina town of Knik, served as gold rush supply posts (USAF 2016e).

JBER became established initially as Fort Richardson in 1939 on the traditional lands of the Dena'ina Athabaskan tribes of Upper Cook Inlet. During the course of World War II, Fort Richardson's mission expanded, growing to support 7,800 troops. During the Cold War, the fort served a training and administrative support role. In 1950, Fort Richardson moved to the current location, and Elmendorf field came under the jurisdiction of the USAF. Both Elmendorf AFB and Fort Richardson assumed a prominent position as part of the first line of defense against attack during the Cold War (USAF 2016e). Consolidation of the two as JBER occurred in 2010.

More than 44 cultural resources surveys have been conducted at JBER since the 1970s (USAF 2016e). In addition, detailed investigation of cultural resources at the excavation site and the proposed disposal site (each known as the APE) were undertaken in 2006 (MARAD 2006) and October 2015 (USAF 2016e), respectively. Surveys consisted of background data research and/or physical site surveys to identify existing, or locate previously unknown, archeological sites, historic properties, or other cultural resources, and to evaluate any existing resources for listing eligibility under the NRHP.

Phase I background research surveys resulted in the identification of 17 previously recorded cultural sites on or within 1 km of the APE, according to the Alaska Heritage Resources Survey (ADNR 2016) (Appendix E). Only one site was within the disposal site APE, which was determined to be Not Eligible for listing on the NRHP by the State of Alaska SHPO in 2006 (USAF 2016e). Of the other 16 sites within 1 km of the APE, only three have been found to be eligible for the NRHP; the descriptions below are taken directly from USAF (2016e).

ANC-00650—This is a communication site consisting of an unattended TD-2 microwave relay tower, which connects Neklasson Lake, 32 miles to the east, Rabbit Creek, 12 miles to the south, and Anchorage ACS, (Alascom tool center), 3 miles to the south. The site was found eligible for the NRHP in 1994 based

on its association with the Cold War. The site is situated more than 750 meters to the west of the proposed APE, placing it far outside the area of potential direct effects from the proposed project.

ANC-02005—This is a corrugated metal structure with a poured concrete foundation. The site was found eligible for the NRHP as a contributing element to the Bunker/Igloo Complex Historic District described below. ANC-02005 is 750 meters to the west of the proposed APE, placing it far outside the area of potential direct effects from the proposed project.

ANC-02577—This Bunker/Igloo Complex Historic District consists of a series of corrugated galvanized steel bunkers with poured concrete floors and wood ends arranged in a circular layout and buried in hillsides and earthworks, connected by a gravel road and wooden stairway, and protected with an array of slit trenches, guard shacks, barbed wire fences, and foxholes. The site was found eligible as a Historic District in 2007 based on initial site reconnaissance. The site is located more than 325 meters to the southeast of the proposed fill dirt project APE, placing it far outside the area of potential direct effects. The site is also located on the opposite flank of the Elmendorf Moraine than the proposed project's APE.

Phase I physical site surveys resulted in identifying two additional potential sites, ANC-04238 and ANC-04239. Both were described as temporary use fighting positions, possibly built during World War II or used as training in the 1950s to 1970s. Both are dilapidated and offer no additional historic indication. Both sites were found to be ineligible for listing on the NHRP and are noted as not warranting further treatment (USAF 2016e).

AHRS lists no archeological resources or historic properties inside the excavation area. However, two historic properties are located south of the intersection of Airlifter Drive and Talley Avenue, including ANC-0431 and ANC-0432 (MARAD 2006). These sites are outside of the project area. ANC-0431 consists of two shallow pits and two piles of milled lumber and trash, which are most likely associated with the second site; ANC-0432 consists of a concrete bunker overgrown with alder trees. The bunker has been identified as being clearly associated with World War II activities and possibly a gas line corridor that transects the site (MARAD 2006). There are at least four archeological sites and two culturally modified trees (CMT) in the area, and the area has a medium to high potential for the existence of cultural resources (MARAD 2006). CMTs include trees that have been altered by indigenous peoples for a variety of purposes and are protected under the Archeological Resources Protection Act of 1979. If the purported archeological sites or CMTs were discovered during extraction, no reports have been made available.

3.9 Earth Resources

This section discusses baseline conditions regarding topography, geology, soils and seismology. Geologic features and seismology are described for the region and for the areas covered by JBER. Soils and topography are described at a more local level for the areas within and around the excavation and disposal sites.

3.9.1 Topography

The elevation of the main base, including the runways and cantonment area is between 180 and 200 feet. The main base area of JBER is built on a floodplain and is relatively flat, but it is surrounded by foothills and large mountains. Elevations above mean sea level in the project area range from 220 feet

at the base of the excavation area to 340 feet at the top of the excavation area. North Hill extends in elevation beyond the top of the excavation area.

3.9.2 Geology

The bedrock beneath JBER is composed of metamorphic rock and consists of conglomerate sandstone, arkose, siltstone, and lithic sandstone (USAF 2016b). This bedrock was shaped during the formation of the Chugach Mountains and is only exposed in a small part of JBER along the western flank of the Chugach Mountains (Gossweiler 1984, as cited in USAF 2016b). Bedrock is found beneath layers of glacial till and unconsolidated alluvial deposits.

Most of the developed area of JBER is constructed over an outwash plain comprised of alluvial deposits from Eagle Creek during glacial advances and from Ship Creek during modern times. It covers much of the runway and cantonment areas of JBER, and it ends roughly at the base of the hills that include the excavation and disposal areas. The primary substrate components are sand and gravel, with organic matter that has washed onto the plain after eroding from the surrounding hills.

The excavation and disposal areas are located in an area composed of Elmendorf Moraine. The Elmendorf moraine is a southwest-northeast trending terminal moraine, consisting of unconsolidated glacial till with poorly sorted boulders, gravel, sand, and silt deposits. The south facing slope that includes the excavation and disposal areas is gently sloping and contains numerous kettles, which are steep-sided depressions created by retreating glaciers. Kettles, of which the disposal area and Fish Lake are examples, may contain bogs, ponds, or lakes. All kettles in the project area are basins, meaning that they are not drained by streams.

3.9.3 Soils

JBER soils are dominated by three types of deposits. These include coarse-grained deposits consisting of alluvial sand and gravel; fine-grained deposits consisting of silt and clay; and glacial till, which includes Elmendorf Moraine, and in which particle sizes vary from clay to boulders (Wikgren and Moore 1997). The latter soil type is the dominant soil type in the project area. Soils found at JBER represent four orders, including entisols, histosols, inceptisols, and spodosols. Soils in the project area are comprised of cryorthents, which are a suborder of entisols. These soils are common on erosional surfaces and support vegetation that forms wildlife habitat (USAF 2016b). The underlying till can be relatively impermeable, which allows water to pond in kettles and other small depressions. The disposal area is comprised of predominantly organic soils. One of the primary components of these soils is Salmatof peat, which is a hydric soil that forms as a dark peat over mucky silt-loam. It has high water capacity and is generally poorly drained. Wetland 3 contains a floating, vegetated mat that has formed over these supersaturated, blackened, organic soils. Specific soil types are displayed in Figure 3-8.

3.9.4 Seismology

Two main fault systems are found in the Anchorage region. These include the Bruin Bay-Castle Mountain fault system, located to the west of JBER, and the Border Ranges fault system, which runs parallel to the base of the Chugach Mountains. This area is tectonically active and has experienced numerous large earthquakes. More than 27,000 earthquakes were recorded in Alaska in the first nine months of 2016 (UAF 2016). The greatest number of these were recorded in the south-central part of Alaska, which includes JBER.

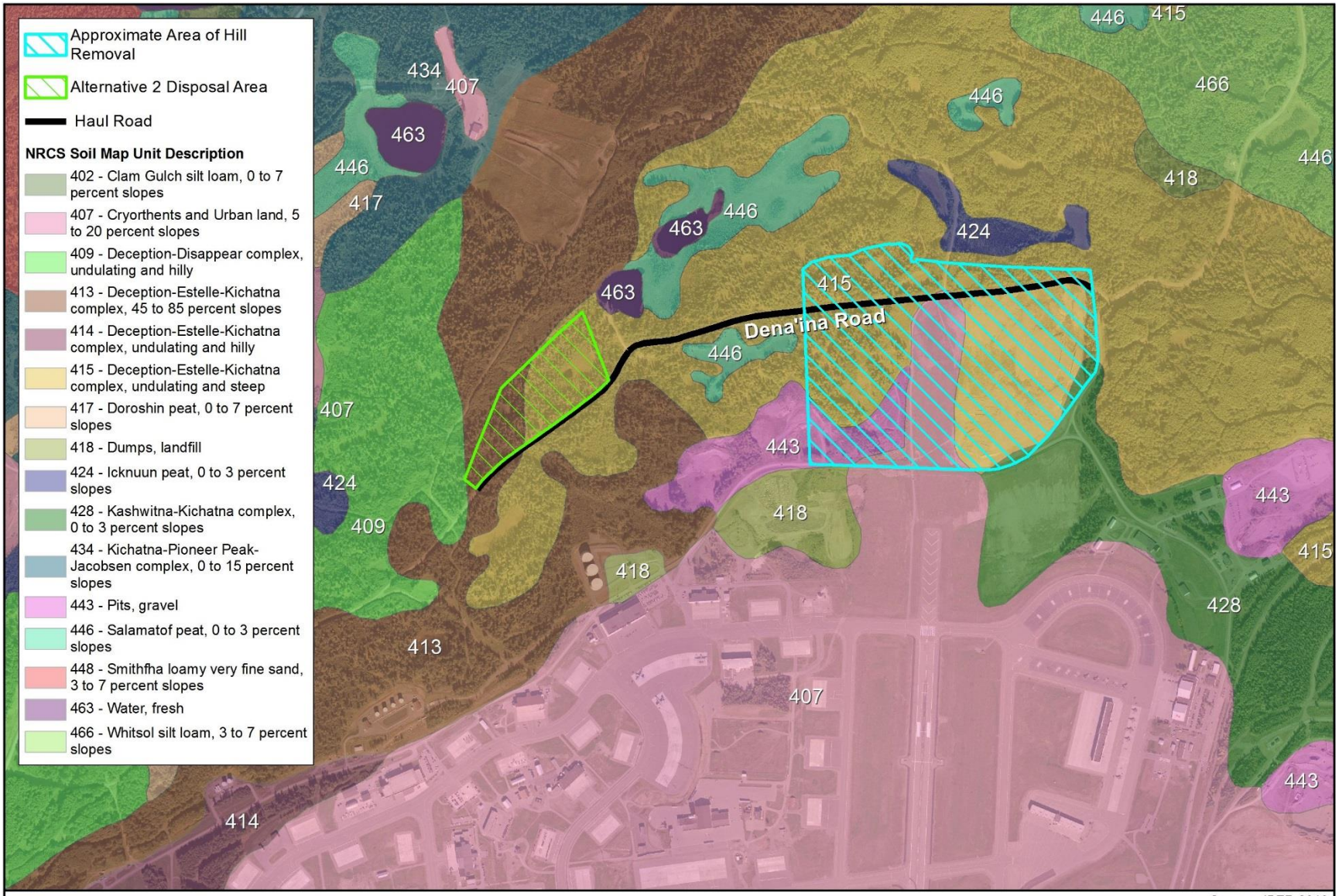

Figure 3-8: Soil Types in the Project Area

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3.10 Socioeconomic Resources

In this section, socioeconomic conditions and factors of influence are evaluated for the defined APE. The socioeconomic character of the study area is summarized by its human and economic environment. Socioeconomic indicators used to describe the study area include population size and age, employment and income.

3.10.1 Socioeconomics

JBER is situated in south-central Alaska, within the boundaries of the Municipality of Anchorage (Anchorage). Anchorage is Alaska's largest city and regional economy, accounting for about 40 percent of the state's population in 2015 (U.S. Census Bureau 2016). Outside the municipality, in the adjacent Matanuska-Susitna Borough, the nearby communities of Palmer and Wasilla are also important to the regional economy, serving as relatively large bedroom communities for those working in Anchorage. JBER's location within Anchorage positions it as an integral part of the socioeconomic character of the region. JBER is adjacent to the Port of Anchorage and is traversed by Highway 1 (Glenn Highway) and the Alaska Railroad, both of which provide arterial routes for movement of goods to the interior of the state.

According to the U.S. Census Bureau, the population of Anchorage has been fairly stable during the last five years, growing from 293,405 residents in 2010 to 298,695 residents in 2015, with a peak of 301,357 in 2013, representing a change of less than or equal to 1 percent year over year. In terms of population age, Anchorage is consistent with the state as a whole, with a median age of 32.6 in 2015, compared to the state's median age of 33.3 for the same year (U.S. Census Bureau 2016).

Table 3-5 presents the population attributable to JBER as compared to Anchorage as a whole. The population attributable to JBER was estimated as the sum of active duty and reserve military members living on or off base and active duty dependents living on or off base. It does not include civilians working on base. As shown in the table, by this metric JBER accounts for 13 percent of Anchorage's population and 5.2 percent of the state's population.

Table 3-5: JBER Population, 2015

Population Type	Living on Base	Living Off Base	Total	JBER Percent (%)
Active Duty and Reserve	5,493	7,395	**12,888**	31%
Active Duty Dependents	9,305	16,306	**25,611**	61%
JBER Total	**14,798**	**23,701**	**38,499**	**100%**
Total Anchorage Population	-	-	298,695	13%
Total Alaska Population	-	-	738,432	5.2%

Source: JBER 2016b and U.S. Census Bureau 2016

Historically, the Anchorage regional economy has been an industrialized one, with a large proportion of economic activity driven by the transportation, military, resource extraction, and government services industries. While these industries are still important, Anchorage's growth has led to further development of professional and service industries. In 2014, the top five industries by total payroll in Anchorage included health care and social assistance (16.3 percent); professional, scientific, and technical services (12.1 percent); construction (11 percent); mining, quarrying, and oil and gas extraction

(10.4 percent); and transportation and warehousing (8.9 percent). In contrast, at the statewide level, professional, scientific, and technical services are the fourth largest contributor to payroll (Census 2014). By employment, Anchorage's top five largest sectors included health care and social assistance (15.3 percent); public administration (11.2 percent); retail trade (11 percent); accommodation and food services (8.3 percent); and educational services (7.5 percent) (U.S. Census Bureau 2015).

The Fiscal Year 2015 JBER Economic Impact Analysis (JBER 2016b) estimated the local economic benefits JBER provides to the regional economy. Table 3-6 summarizes these effects.

Table 3-6: Economic Impacts of JBER

Effect	Impact	Percent
Military Payroll	$752,748,841	47%
Federal Civilian Payroll	$183,877,274	12%
Other Civilian Payroll	$22,204,742	1%
Indirect Employment	$318,069,990	20%
Effect	**Impact**	**Percent**
JBER Expenditures	$323,293,383	20%
Subtotal	**$1,600,194,230**	**100%**
Source: JBER 2016b		

In 2015, JBER supplied 16,283 jobs on base with a total payroll of $958,830,857. In, addition, it was estimated that JBER-derived employment income indirectly created 5,589 jobs, each with an average annual pay of $56,910, or a total indirect effect of $318,069,990. Finally, JBER expenditures for construction, services, and procurement of materials, equipment, and supplies amounted to a total of $323,293,383. In total, the 2015 estimated contribution of JBER to the regional economy was just over $1.6 billion dollars.

3.11 Transportation

This section describes the transportation network within JBER. Modes of transportation at JBER include vehicle, train, aircraft, and pedestrian. Within the potential area of effect, transportation is provided primarily from aircraft using Elmendorf Airfield and vehicles using Dena'ina Road.

The 673 ABW is the host unit for JBER and is responsible for providing expeditionary combat support and day-to-day operations of the installation, including JBERs' transportation network.

JBER is accessed through 4 gates on the south side of the base, and one gate on the Davis Highway. Primary access to the base is by the Glenn Highway (U.S. Highway 1) which bisects JBER. From Glenn Highway, access is provided by the Richardson Drive, Muldoon Road, and Boniface Parkway gates. Richardson Drive proceeds to the heart of the base and becomes the Davis Highway as it approaches the cantonment area. JBER is also accessible from Post Road and the A/C Street Couplet.

Rail service is provided to JBER on an as-needed basis by the Alaska Railroad Corporation. The main rail line crosses between the two cantonment areas, and a spur extends to a loading facility and an ammunition storage complex. The railroad offers both freight and deployment services to various ports and cities in southern Alaska.

The JBER-Elmendorf airfield includes the east-west runway (Runway 06/24) and a north-south runway (Runway 16/34), both of which are Class B asphalt runways (Figure 3-9). In 2014, the predominant direction of departures of the F-22 fighter on Runway 16/34 was from south to north (Runway 34). The north-south runway is 7,493 feet long and 150 feet wide. Bryant Army Air Field is located adjacent to the JBER-Richardson cantonment area and the Glenn Highway and has a 4,088-foot-long, north-south runway. Operations to and from the south are challenging given the proximity to the city of Anchorage and numerous conflicts with nearby airfields including Merrill Field, the Lake Hood Seaplane base, and the Ted Stevens Anchorage International Airport.

The area of effect for transportation would be entirely within existing JBER lands (Figure 3-9), and trucks or other equipment would remain in the project area aside from during mobilization and demobilization. The area of North Runway excavation would occur between Dena'ina Road to the north and west, Airlifter Drive to the south, and Talley Avenue to the east. Airlifter Drive is a two-lane paved road, and Dena'ina is a wide dirt surface road. Talley Avenue is a non-improved dirt road. Several unnamed dirt roads are present crisscrossing the site from Dena'ina Road to Airlifter Drive. Public access to these roads is limited to special uses; general use is restricted to JBER personnel.

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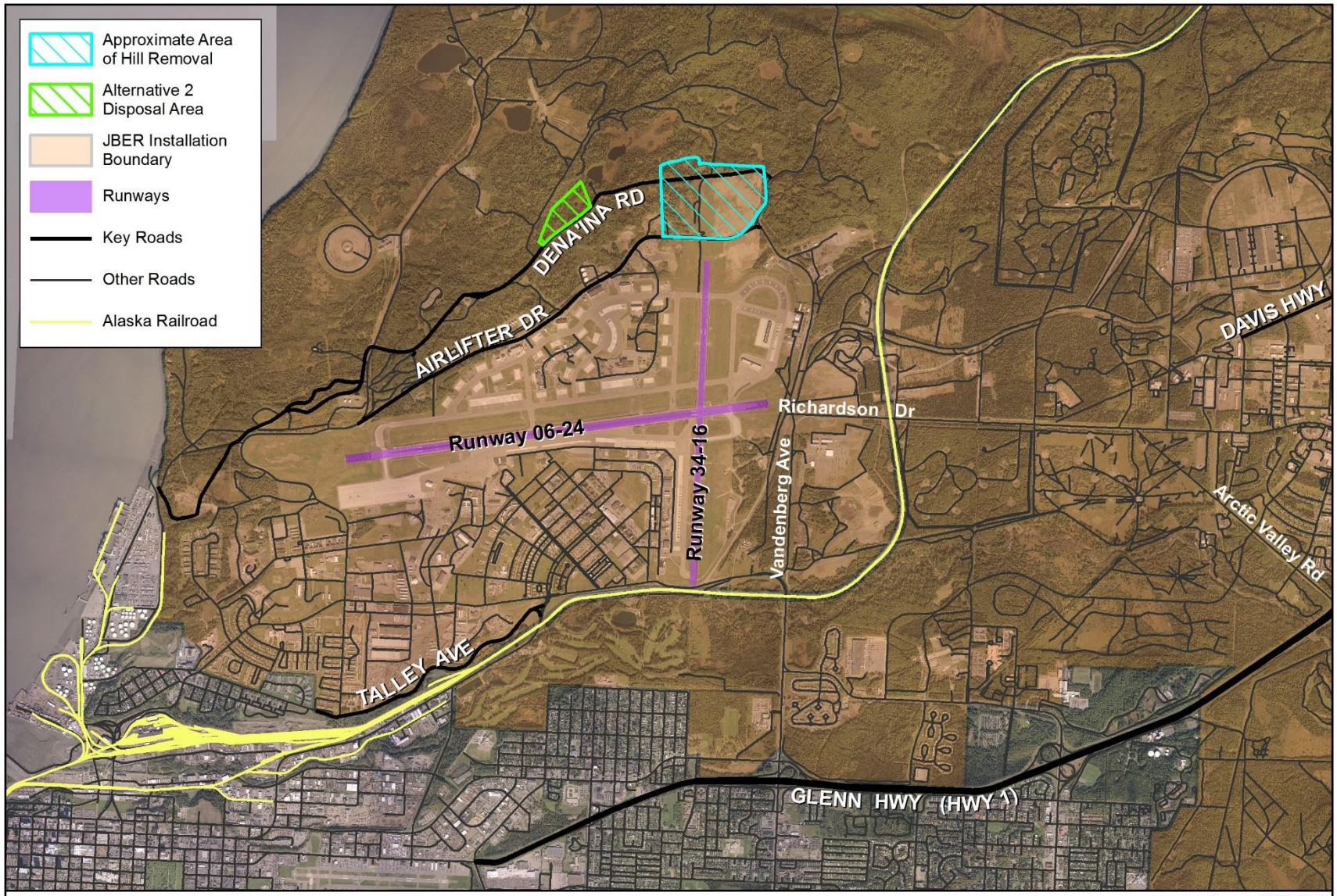

Figure 3-9: Transportation

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4 Environmental Consequences

This chapter analyzes potential environmental impacts that may result from implementation of the proposed North Runway Hill Removal Project. This chapter considers the direct and indirect consequences of both excavation and operation of the excavation and disposal areas under the Proposed Action Alternative and the no action alternative, and identifies measures that may be incorporated to minimize impacts. This chapter also discusses the potential cumulative effects that the proposed project may have in combination with other past, present, or reasonably foreseeable projects.

4.1 Aesthetics / Visual Resources

4.1.1 Proposed Action

Removing approximately 2,000,000 cy of earth from the hill during excavation would alter the visual condition of the area. Increased levels of construction equipment would be present, the hill would be lowered incrementally in elevation, and vegetation communities would be removed or modified.

During 2017 and 2018, excavation would occur between ground freezes (May – September), for an estimated 150 days each year. Visual conditions would be affected by the presence of front-end loaders, excavators, tractor-mounted bulldozers, water distributors, fuel trucks, pump systems with generators, floodlights, dump trucks, and/or scrapers, which would be onsite 18 hours a day, six days a week. All excavation would take place on JBER property, within an active military site where the presence and use of large equipment, trucks, and aircraft are common. Any increase in excavation activity from current levels would be temporary (2017 – 2018), and would be limited to the 150-day excavation window. The presence of construction equipment would therefore not result in substantial changes to visual conditions in comparison to current conditions.

As excavation progresses, vegetation in the excavation and disposal areas would be altered. In the excavation area, trees and shrubs would be completely removed to allow for the hill elevation to be lowered. This would result in a temporary clearing of the area. Trees within the disposal area would be cut and removed, and the wetlands would be filled. These visual alterations would represent a substantial change in local visual conditions. However, as described in the following sections, native vegetation communities would be allowed to regrow at both sites. As a result, the effects of vegetation removal on visual character would be temporary, although trees grow slowly in Alaska due to the short growing season, and it may take decades for the current aesthetic environment to be restored.

At the disposal site, native forest would be allowed to regenerate without modification because it is outside of the glide path. Over time, although wetlands would no longer be present, conditions at the site would be visually comparable to the present, with forest and shrubland vegetation community types.

The excavated area is within the glide path, and is designated as a Clear Zone, where the target vegetation type is shrubland with 60 percent or greater coverage. JBER personnel would manage the regrowth of vegetation to eliminate tall trees and to encourage shrubs and herbs to dominate the site. This shift in vegetative cover is expected to minimize the presence of birds of prey that are potential airstrike hazards. The shift from forest to shrubland has been underway for several years, as the north hill has been excavated to reach optimum glide path dimensions. The continued alteration would not

reflect a substantial change in visual character from current conditions. There would be no significant impacts to aesthetics and visual resources.

4.1.2 No Action

Under the no action alternative, the excavation area would be revegetated and the forested community that has been removed would be replaced with a low-growing, shrub community. This effect would be subjective and based on the viewers preference, but in general this effect would be minor.

4.2 AICUZ / Land Use / Acoustic Environment

4.2.1 AICUZ

4.2.1.1 Proposed Action

Excavation activities would require using machinery that emits particulate matter and outfitting construction vehicles with floodlights and headlights. Smoke emissions and the use of bright lights are restricted in AICUZs due to their potential to disrupt flight operations or impair pilot vision. These impacts would be temporary, and smoke emissions would quickly disperse before they would reach elevations where aircraft are operating. Floodlights or headlights would be used after dark when few aircraft are operating due to flight time restrictions of 7 a.m. to 10 p.m. During the summer, daylight hours will extend well beyond these hours and artificial lighting will not be needed at these times. Although some light transmissions may occur during flight operations times, this effect is expected to be less than significant. There would be no significant impacts to AICUZs.

4.2.1.2 No Action

No permanent structures would be installed in the excavation area, and existing land uses would remain in place during operations, therefore there would be no effects to AICUZs from the no action alternative.

4.2.2 Land Use

4.2.2.1 Proposed Action

Land uses in the project area would not change during the excavation or operations periods. Current project area land use designations would remain in place, and ongoing restrictions to development or other active uses would continue. The Proposed Action would not divide an established community or alter land uses outside of JBER, nor would it alter noise contours on or off the base. Recreational uses of the site are minimal and would not change as a result of the Proposed Action. Land uses during excavation and operations would be consistent with current land use plans as well as future land uses proposed in the JBER IDP (USAF 2015b). There would be no significant impacts to land use.

4.2.2.2 No Action

Under the no action alternative, there would be no adverse effects to land use or recreation.

4.2.3 Acoustic Environment

4.2.3.1 Proposed Action

Excavation activities would result in short-term increases in noise levels near the project site due to the use of heavy equipment such as excavators, backhoes, and dump trucks. Sound attenuates (lessens) over distance and when it encounters obstacles such as terrain or trees. Excavation would occur far enough away from the nearest occupied buildings that noise levels would be below ambient noise levels

at these sites, which are 0.25 mile from the project site, and at sensitive receptors, which are 1.75 miles from the project site.

A mathematical model based on the Federal Transit Administration (FTA 2006) and Federal Highway Administration (FHA 2006) data and impact assessment methods was used to estimate noise levels associated with project construction near residences. The model uses FTA and FHA reference sound levels (at a distance of 50 feet) for the construction equipment that would be used. The model determines a composite noise level for the simultaneous operation of multiple pieces of construction equipment, taking into account the estimated number of each type of equipment (count at peak) and the amount of time each type of equipment would be operating (usage factor). The model then evaluates sound propagation and attenuation to determine the received sound levels at distances of 500 feet and 0.25 mile, which is the approximate distance from the site to the nearest buildings. In order to provide an upper bound of effects, the model assumes no equipment mufflers or other sound dampening or shielding effects.

Table 4-1 presents the predicted sound levels associated with excavation activities. Noise is reported as dBA, with both the maximum sound level (Lmax) of each piece of construction equipment and the composite equivalent sound level (Leq) of all construction equipment reported.

Table 4-1: Predicted Sound Levels during Excavation

Construction Equipment	Count At Peak	Usage Factor (percent)	Noise Level at 50 feet, dBA Lmax	Composite Noise Level at 50 feet, dBA Leq	Noise Level at 500 feet, dBA Lmax	Composite Noise Level at 500 feet, dBA Leq	Noise Level at 0.25 mile, dBA Lmax	Composite Noise Level at 0.25 mile, dBA Leq
Backhoe	2	70	80	95	52	69	41	57
Bulldozer	3	80	85		57		46	
Dump Truck	4	80	84		56		45	
Excavator	4	90	85		58		47	
Fork Lift	1	40	85		54		43	
Front End Loader	2	40	80		49		38	
Fuel Truck	1	10	85		48		37	
Grader	1	40	85		54		43	
Water Truck	1	30	82		50		39	

Source: FTA 2006; FHA 2006. Notes: dBA = A-weighted decibel; Leq = equivalent continuous sound level; Lmax = maximum sound level
Count at peak is the maximum number of that type of equipment that could be operating simultaneously.
Usage factor is the percentage of time that type of equipment would be in use during excavation activities.

As shown in Table 4-1, excavation noise would be audible near the project site; however, excavation noise would attenuate to below DNL noise levels before reaching the nearest buildings. At the nearest buildings (0.25 mile away), which are near the flight line and house maintenance and administrative functions, excavation noise would be approximately 57 dBA, which is well below the approximate DNL sound level of 78 dBA at these sites (see Figure 3-2). Therefore, there would be no effects. At the

nearest sensitive receptors, which are approximately 1.75 miles southwest of the project site, excavation noise would not be audible, so there would be no effects on sensitive receptors. Excavation noise levels during the Proposed Action could be reduced if construction machinery were properly maintained and muffled.

Workers at the excavation site would also experience increased noise levels. Workers would wear adequate hearing protection as appropriate and in accordance with the project health and safety plan and applicable occupational health and safety regulations, so adverse effects would be minor. Runway utilization and flight operations would remain the same during the Proposed Action. Project activities are not expected to impact aircraft noise patterns. Overall, short-term effects on the acoustic environment would be minor; no significant impacts would occur.

Once excavation was completed, sound levels in the area would return to baseline levels, so there would be no long-term effects. There would be no significant impacts to the acoustic environment.

4.2.3.2 No Action

Under the no action alternative, the project would not be implemented. The noise environment would be unchanged, so there would be no effects.

4.3 Air Quality

4.3.1.1 Proposed Action

Under the Proposed Action, potential impacts to air quality include dust generation from the excavation and transport of soils and the emission of CO, SO_2, and NO_2 by diesel equipment. Although it is not anticipated the Proposed Action would result in violations of regional or federal air quality standards, emissions modeling was conducted to demonstrate compliance with EPA mandatory reporting requirements. The Road Construction Emissions Model, Version 7.1.5.1, was used to estimate emissions of pollutants generated by construction equipment and workers vehicles, as well as soil disturbance. It models emissions of criteria pollutants and greenhouse gases (GHGs) for all aspects of excavation, including grading, earth moving, and worker commuting (SMAQMD 2015). The model automatically estimates fuel usage, fuel types, and other emissions factors using key data inputs that describe the project. For this project, it was assumed that all excavation and deposition activity would begin in 2017, would occur 18 hours per day, 6 days per week, and would be completed in one or two six-month excavation seasons. Additional data inputs included estimates of the equipment that would be used, the volume of material to be removed, and the total acreage that would be disturbed The emission calculations are based on standard vehicle emissions rates that are built into the model. The calculations and outputs from this model are shown in Appendix F.

The amount of PM_{10} that may be generated on a daily basis was also estimated. As shown in Table 4-2, there would be no exceedances of federal or local air quality standards during excavation of the project.

Total GHG emissions are reported as the carbon dioxide equivalent (CO_2e), which summarizes and aggregates the global warming potential of the GHGs, including reactive organic gases (ROG), carbon dioxide (CO_2), and nitrous oxide (N_2O). EPA mandatory reporting requirements for GHGs are in place for projects or stationary sources that would contribute at least 25,000 metric tons of GHGs to the atmosphere. As shown in Table 4-2, the Proposed Action would contribute far less than that amount.

Table 4-2: Air Quality Standards and Estimated Emissions

Emissions Component	Criteria Pollutant Emissions					
	ROG	**CO**	**N_2O**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Estimated Maximum Construction Emissions	11.6 lbs./day 0.7 ton/year	58.1 lbs./day 3.6 tons/year	138.4 lbs./day 8.5 tons/year	55.4 lbs./day 2.2 tons/year	15.2 lbs./day 0.7 ton/year	19,295.7 lbs/day 1,186.0 tons/year
Emissions Component	**Criteria Pollutant Emissions**					
	ROG	**CO**	**N_2O**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Federal Threshold	50 tons/year	100 tons/year	50 tons/year	100 tons/year	n/a	25,000 tons/year[1]
State Threshold	10 tons/year	100 tons/year	10 tons/year	100 tons/year	15 tons/year	n/a
Above Threshold	No	No	No	No	No	No

Source: SMAQMD 2015, Version 7.1.5.1, modified for grading/excavation. ROG = Reactive Organic Gases.
[1]Amount of GHG emissions for major facilities that are required to report GHG emissions (25,000 metric tons of CO_2/year) under EPA Final Mandatory Reporting of Greenhouse Gases Rule.

In all, the above analyses indicate that soils excavation and disposal and the operation of construction equipment and employee vehicles would have only a minor effect on project area air quality. Therefore, impacts would be less than significant.

In some cases, the excavation of reduced wetland soils can release sulfidic odors that are commonly found to be objectionable. In instances where these soils are stockpiled for later reuse, this type of effect may persist for the duration of excavation. The wetland delineation performed for this study area (Johnson 2015) did not identify gleyed soils or other hydric soil types that would have high concentrations of sulfides or sulfates that could cause objectionable odors. In addition, most of the excavation of wetland soils would occur at least one mile from the nearest residences. Therefore, this effect would be minor.

Dust is likely to be generated during the excavation and transport of soils. In general, excavated soils are likely to be moist as they would be excavated from lower-lying areas where moisture is most persistent. Therefore, dust from excavation would be minimal. PM_{10} from movements of construction vehicles would be minimized through the application of water to the roadway by a water truck. This would occur as needed, but at least once per day. Other measures required as part of the SWPPP, including covering stockpiles of soils, would also help to minimize release of dust. Effects from release of fugitive dust are likely to be less than significant. There would be no significant impacts to air quality.

4.3.1.2 No Action

Under the no action alternative, minor impacts from release of fugitive dust would be expected until plant communities in the excavation area matured and soils were stabilized. This effect is likely to be less than significant. There would be no other sources of emissions under the no action alternative.

4.4 Water Resources

4.4.1.1 Proposed Action

Impacts to surface water may include loss of wetlands, pollution, and diversion of seasonal drainages. These impacts would be adverse, but less than significant. Although up to 17.2 acres of wetlands would be filled or otherwise affected by the Proposed Action, these wetlands are non-jurisdictional and are a small portion of the wetlands available for water quality purposes in the project vicinity. Impacts to surface waters may occur as a result of sediment entrainment as stormwater flows over exposed soils. Impacts would be minimized by adherence to stormwater management measures and BMPs identified in the SWPPP and in Section 4.9 (Earth Resources). Impacts related to elevated sediment concentrations would be temporary, lasting primarily for the one or two seasons of excavation-disposal for most areas, and would be intermittent, occurring only during precipitation events. These impacts would be less than significant.

Loss of up to 17.2 acres of isolated wetlands may affect groundwater and water storage. Approximately half of this amount of wetland would be filled and converted to upland habitat, and the other half would be excavated but not necessarily filled. Groundwater movement and infiltration may be affected by filling the deposition area. In general, groundwater may be restricted from passing through the former wetland found in the deposition area when filled with compacted topsoil. Groundwater would likely pass around the former wetland area into and through the shallow aquifer that surrounds and underlays the project area. In addition, since the direction of groundwater movement in this area is to the south, and the disposal area is located south of Fish and Triangle Lakes, groundwater movement is away from Fish and Triangle Lakes and towards the disposal area. Therefore, filling the wetlands in the disposal area is not likely to affect groundwater supply to either of these lakes. Potential impacts to groundwater quality from exposure to hazardous materials or other pollutants are addressed in Section 4.6, Hazardous Materials. Storage of surface water in the wetlands would be reduced relative to current conditions, which may increase runoff during snowmelt or precipitation. Although this impact is adverse, it would be less than significant, since adequate measures are in place to manage increased runoff.

There are no permanent or substantial streams in the excavation or disposal areas, so diversion of drainages within the project area would be a less than significant impact to water quality or water supply. These drainages carry water only during storm events, and they do not offer habitat for fish or wildlife. Although under normal circumstances, these drainages may feed into Ship Creek, this condition has been altered by the stormwater control berms and other features constructed in and around the project area. Therefore, polluted runoff would not reach Ship Creek or other waters of the U.S. other than the Knik Arm of Cook Inlet, which is the ultimate receiving water body for site runoff. Due to the continuing use of silt fences, compost socks, wattles, and other features designed to detain stormwater runoff, much of the suspended sediment is likely to settle out before it reaches Cook Inlet. Once it arrives in Cook Inlet, it would rapidly disperse and attain low concentrations. Additionally, diverting surface waters to Cook Inlet would not affect water availability, as the project area drains into the watershed downstream of Ship Creek Reservoir, which is the base's primary water supply reservoir.

Prior to initiating excavation or disposal, a new SWPPP would be prepared to cover the 2017 excavation season. Like previous SWPPPs, the new SWPPP would contain measures to prevent and control erosion and sedimentation during excavation-disposal and operation. It would protect adjacent and

downstream properties and water bodies from erosion-related effects, sedimentation, and flooding and control accidental discharge of polluting or hazardous materials. It would also ensure that potentially hazardous materials are handled, transported, and stored in compliance with local, state, and federal requirements. The SWPPP would apply to both JBER and the excavation contractor and would be filed with ADEC and U.S. EPA.

Minor road improvements and ongoing road maintenance would occur during the excavation-disposal period but would have little effect on water quality. The main haul road, Dena'ina Road, is well established and has been used for similar purposes. Therefore, it already has storm ditches, proper drainage, and other features necessary to manage stormwater and reduce contamination. Use of this road, including improvements and maintenance, would be consistent with requirements of the SWPPP, and impacts are expected to be less than significant. There would be no significant impacts to water resources.

4.4.1.2 No Action

Under the no action alternative, some erosion from the excavated area would be expected to continue until plant communities have matured and stabilized the soils. Stormwater would continue to be managed as it is under current operations, and any impacts would be minimal.

4.5 Safety and Occupational Health

4.5.1.1 Proposed Action

Work at the hill removal area would occur approximately 1,500 feet north of Runway 16/34 inside an airfield clear zone or APZ I and, in the southeastern corner of the excavation area, within a QD arc. Although there is an elevated risk of an aircraft accident or explosion in these areas compared to other areas, the risk is still small and not significant.

Project excavation would require FAA notification under 14 CFR §77. The USAF would notify the FAA at least 45 days before the start of excavation by submitting FAA Form 7460-1, Notice of Proposed Construction or Alteration. The USAF and FAA would work together to resolve any issues that could affect JBER flight operations. By complying with 14 CFR §77, there would not be a significant risk to air navigation from construction equipment in the hill removal area.

Excavation activities would present typical excavation site safety risks to workers. These risks would be minimized by complying with occupational health and safety regulations and by implementing standard excavation site safety BMPs. Excavation sites would be signed, and public access would be prohibited. A health and safety plan would be developed and implemented. Workers would practice excavation safety measures, such as holding daily safety briefings and wearing appropriate protective footwear, gloves, clothing, and hearing and eye protection. With the implementation of these or other appropriate excavation site safety BMPs, adverse effects would be minor.

As described in Section 3.6, contaminated soil could be present in the southeastern portion of the hill removal area (Figure 3-4). If soil or water suspected to be contaminated is encountered, work would stop in that area, a designated manager would be contacted, and work would not resume until appropriate actions were taken to minimize any risks. Appropriate actions could include additional

personal protective equipment, such as respirators or additional protective clothing; sampling air, soil, or water to determine contaminant levels; and excavation or *in situ* remediation of contaminants.

Implementing the Proposed Action would have a substantial beneficial effect on the safety of flight operations at JBER. As described in Section 1, the purpose of and need for the Proposed Action is to remove hilly terrain north of the runway to ensure the safety of flight operations. Currently, the runway does not meet UFC 3-260-1 approach-departure surfaces criteria or FAR Part 77 flight path obstruction criteria. To conduct runway operations, the USAF is required to implement waivers to both the FAA and USAF flight safety regulations. The waivers are granted on a temporary basis, and the hazard needs to be corrected. Removing the hilly terrain north of the runway would bring the runway into compliance with UFC 3-260-1 and FAR Part 77, eliminating the need for waivers and increasing the safety of flight operations, resulting in a substantial beneficial effect. There would be no significant impacts to safety and occupational health.

4.5.1.2 No Action

Under the no action alternative, hilly terrain north of Runway 16/34 would continue to obstruct the optimal flight path for arriving and departing aircraft, and FAA and USAF flight safety regulation waivers would continue to be required to use the runway. The waivers are granted on a temporary basis. If the hilly terrain was not removed, departures and landings could be restricted and approach angles would be steeper than recommended, resulting in a potential adverse effect on flight crew safety and mission readiness.

4.6 Hazardous Materials / Waste

4.6.1.1 Proposed Action

Excavation would involve the use of common hazardous materials and petroleum products. Vehicles and equipment would contain fuel, oils, and lubricants. Construction equipment may be fueled on-site, and minor repairs may be conducted on-site; however, routine or major repairs would be done off-site at an appropriate maintenance facility. Excavation may generate some waste such as used oil or oily rags. Leaks or accidental spills or releases could occur.

To ensure safe handling of hazardous materials and minimize the potential for spills or accidents, these materials would be managed in compliance with applicable regulations, USAF policy and procedures, and the JBER EMP. The EMP includes, among other things, BMPs for hazardous material management, worker training, spill response, waste transport and disposal, and good housekeeping (USAF 2016d).

The excavation contractor would be required to prepare and implement a site-specific health and safety plan for the work. All workers would be trained on the health and safety plan provisions, and it would be available onsite at all times. Daily safety briefings would be held to review information contained in the plan.

Because the project would disturb more than 1 acre, the excavation contractor would be required to prepare and implement a construction SWPPP. The SWPPP includes, among other things, BMPs for vehicle fueling and maintenance and spill response (see also Section 4.4).

Collectively, these documents would detail the measures needed to comply with applicable regulations, ensure safe handling and disposal of hazardous materials and waste, minimize the potential for spills, and respond to a spill if one occurred. Therefore, effects would be negligible to minor.

Examples of applicable BMPs that are contained in the EMP or would be contained in the health and safety plan or SWPPP include:

- A description of hazardous materials to be used (such as a safety data sheet) and handling procedures would be available on-site.
- Emergency contact information and written procedures for notifying environmental response agencies would be posted at the work site.
- Drip pans or similar devices would be used to capture minor leaks. Excavation equipment would be regularly inspected for leaks, which would be promptly repaired.
- Spill containment kits, with written instructions for cleanup and disposal adequate for the types and quantities of materials used at the site, would be available at the work site.
- Workers would be trained in spill containment procedures and would be informed of the location of spill containment kits.

As described in Section 3.6, an equipment operator noticed an odor in the soil at the excavation area while working there in 2004. The approximate area is shown as "2004 POL" on Figure 3-4 (MARAD 2006). This area is not included in JBER's Environmental Restoration Program and the potential for soil contamination to remain in the area is unknown. In addition, the hill removal area is in the gravel pit area, which has been previously disturbed; therefore, it is possible contamination could be found there. If soil suspected of being contaminated is encountered during excavation in these or other areas, measures would be taken to characterize and remove the contaminated soil.

The necessary measures would depend in part on the scope of the affected area. If a localized area of contamination was found, it might be sufficient to excavate the affected soil, place it in a separate container, profile excavated soil for disposal[1], and dispose the soil at an appropriate disposal facility such as a landfill. If a larger area of contamination was found, additional soil sampling could be required to confirm the lateral and vertical extent of the contamination and, after excavation was complete, to confirm that all affected soil was removed.

If soil contamination was found, the JBER Environmental Program Office would be contacted immediately. JBER environmental staff would be involved in each step of the response process and would coordinate with ADEC, as needed, to report findings and coordinate actions taken. JBER environmental staff would have primary responsibility for ensuring the soil was managed in accordance with applicable regulations, USAF policy and procedures, and the EMP (USAF 2016d).

Workers would wear appropriate personal protective equipment, such as gloves, dust masks or respirators, and protective clothing, so the risk of worker exposure to contaminated soil would be low (see Section 4.5).

Removing and properly disposing of contaminated soil, if found, would result in a beneficial effect since this contamination would be removed from the environment. Although pollutants naturally attenuate over time, they could also migrate to groundwater. Removing contaminated soil, if present, would

[1] In this context, soil profiling is the process of sampling the soil to determine contaminant levels and, based on these levels, determining appropriate disposal or reuse options. Landfills require soil profile data to accept waste for disposal.

prevent pollutants from migrating to groundwater, resulting in a beneficial effect. There would be no significant impacts associated with hazardous materials or waste.

4.6.1.2 No Action

Under the no action alternative, the project would not be implemented. Contaminated soil, if present, would remain in place. Contamination would naturally attenuate over time. However, contamination could also migrate to groundwater over time, resulting in an adverse effect.

4.7 Biological / Natural Resources

4.7.1 Vegetation

4.7.1.1 Proposed Action

During excavation under the proposed alternative, vegetation throughout the area of excavation would be systematically removed to allow the elevation of the hill to be lowered. Trees at the excavation site would be cut with chain saws and hauled out to Dena'ina Road, then taken to a stockpile area and made available for public wood cutting. Stumps would be left in place, and vegetation would be cut low to the ground to discourage use by wildlife. In this area, removal of vegetation has been occurring for several years to facilitate improved conditions for the north runway glide path. Because the project would remove a relatively small area of trees that still remain in the excavation area, the overall result would be a net loss of forest.

Similarly, in the disposal area, existing forest would be completely removed during the project, resulting in a temporary loss of 14 acres of forest. After completion of the project, this area would be allowed to naturally revegetate with native forest and shrub species, so effects would be temporary, although it may take decades for regrowth of tree species.

Following completion of the proposed project, the glide path area would be managed as a Clear Zone – an area where birds are discouraged from entering. Although the excavation area would not be actively revegetated after excavation is complete, the area would be maintained to discourage regrowth of tall trees or plant communities that would attract birds. To expedite succession of functional habitat in the disposal area, the upper 10-12 inches of topsoil from previously undisturbed areas would be salvaged and spread over disturbed areas, where possible. Topsoil would be stored separately from subsoil, signed as topsoil, and stored in a manner that will keep it viable until it is spread back over the disturbed site. No active revegetation is proposed for the disposal site.

Following completion of the project, the regrowth of native shrub and tree communities would be allowed in the disposal area. No limitations would be placed on regrowth in this area, as it is outside of the glide path. There would be no significant impacts to vegetation.

4.7.1.2 No Action

Under the no action alternative, the proposed project would not be implemented and forested areas would not be cleared. Shrub vegetation would colonize the excavation area, and the wetland vegetation would persist.

4.7.2 Wetlands

4.7.2.1 Proposed Action

As the glide path is excavated, a total of 8.7 acres of wetlands in the excavation area would be altered. As excavated materials are deposited, a total of 8.5 acres of wetland in the disposal area would be filled. Overall, a total of 17.2 acres of wetland would be affected by this project. USACE review of wetland delineation reports, prepared for wetlands at both the excavation site and disposal site, has concluded that none of the wetlands at either site are jurisdictional. None of the subject wetlands have any discernible outlet and therefore there is no outfall that would release or connect the subject wetlands to lands outside of the immediate drainage basin, hence the conclusion from the USACE that the wetlands were jurisdictionally isolated, and a Department of the Army permit is not required for any wetlands that would be affected at the disposal site (POA 2015-556) or excavation site (POA-2014-531).

The functional effect of loss of these wetlands include reduced habitat for birds and wildlife that may rely on wetlands during all or part of their lifecycle, reduced water storage, and potential effects to nearby water bodies due to altered groundwater movement. These wetlands may be accessed at various times by moose and numerous avian species. However, given the high level of disturbance of the surrounding area by ongoing excavation, and because ample suitable habitat for these species exists in the surrounding area, loss of this habitat is likely to be less than significant. Furthermore, because the wetlands lack connectivity, including significant nexus to any other Water of the U.S., by definition, they do not have any significant functional value to the conservation of anadromous fish species nor the federally endangered Cook Inlet Beluga Whale.

Loss of water storage during runoff of rain and snowmelt would be localized, and given that these wetlands comprise less than 0.3 percent of the 4,800 acres of depressional wetlands on JBER, this effect would be less than significant. Shallow groundwater, which may pass between the disposal area and Triangle and Fish Lakes, may be altered by filling the disposal area wetlands, which are maintained partially by groundwater. However, shallow aquifer groundwater movement generally follows surface topography, which in this instance is from northeast to southwest. This pattern would cause shallow groundwater to move from Fish and Triangle Lakes towards the disposal area, and it would not affect the quantity or quality of groundwater entering the lakes. There are no other substantial waterbodies downslope of the disposal area that would likely be affected.

Wetlands that are disturbed during excavation of the glide path would be cleared of vegetation, and soil would be removed. Over time, however, these areas could potentially return to wetland conditions, if soil conditions and groundwater table are appropriate. JBER would manage vegetation throughout the excavation area for Clear Zone characteristics, including making sure that no open water areas form. As a result, if any wetlands reoccur, they would be dominated by low growing willows and other shrubs.

At the disposal site, vegetation would be allowed to regrow to mature forest. At this site, wetlands are unlikely to reform since deposition of materials would separate surface soils from groundwater.

Wetlands at the excavation site may return over time. It may be possible that excavation efforts would increase existing wetland area, since removing surface soils would bring the water table closer to the surface. Regardless, vegetation management would ensure that no open water areas form that would attract waterfowl or other potential aircraft strike hazards. Furthermore, after excavation is complete, it could take decades for hydrologic conditions to reform wetlands. A loss of 8.74 acres of wetland would

result in changes in habitat availability. Amphibians, song birds, waterfowl, and small mammals are the most likely to be affected. Aquatic species are not likely to be abundant or diverse at these wetlands, since they have only small areas of standing water, which completely freeze each winter. According to wetland delineations previously completed, there are several additional wetlands that are within 0.2 miles of the excavation site. Most species within the wetlands would readily disperse to these other wetlands. Other wetlands in the vicinity are larger, have greater areas of open water, and are further from roadways. Due to the relatively small area of wetland loss and the availability of other wetlands nearby, effects to wildlife associated with wetlands would be less than significant. There would be no significant impacts to wetlands.

4.7.2.2 No Action

Under the no action alternative, no wetlands would be filled and there would be no loss of wetland functionality.

4.7.3 Wildlife

4.7.3.1 Proposed Action

During excavation, the presence of equipment and generation of noise would discourage wildlife from entering the excavation area. If already present, most wildlife species would likely move away to areas where disturbance was minimal. There is little likelihood of large mammals inhabiting the area, since the excavation site has in use for several years, and habitats in the area are highly altered. Small mammals and birds are more likely to be present in the excavation area. As excavation progresses gradually from one area to another, some species would have adequate time to relocate, but smaller species of amphibians and reptiles may not be able to move quickly enough to avoid mortality. There are no threatened or endangered species that use the excavation area or any adjacent areas. Excavation activities would temporarily affect the use of the excavation site by wildlife, but they would have no long-term or significant adverse effects to these populations.

Within the disposal site, the initial activity prior to disposal would be tree removal. This process would be timed to occur prior to the avian breeding season to discourage nesting in the work zone. Non-breeding wildlife remaining in the disposal area are expected to relocate out of the area as construction equipment is introduced to the site, and trees are felled. There are no threatened or endangered species in or near the disposal area. Excavation activities would temporarily affect the use of the disposal site by wildlife, and it would convert the habitat type from bog and forested wetland to upland forest. Although no bald eagle nests have been identified in the vicinity of the project area, they would be avoided by maintaining a 660-foot disturbance buffer between the edge of the excavation area and the nest, and extremely loud noises such as from blasting would be avoided within 0.5 mile of any nests, per the recommendation of USFWS (Appendix B).

Following excavation, the excavation site would be managed as a Clear Zone, where preferred vegetation communities include 60 percent or more cover of native shrub and understory. Clear Zone vegetation communities are native habitats of early seral stage plants and shrubs, which are selected because they do not grow tall enough to impinge on the space needed around airfields for safe operation. Low shrub cover discourages raptors from using the area, and thereby reduces the potential for aircraft strike hazards. As described above, moose have increased in the area as vegetation management has progressed. This transition of the approximately 75-acre excavation site to shrub and understory vegetation would increase the overall area for moose habitat. Conversion of this habitat

from forest to early seral-type vegetation would primarily affect tree-nesting birds, which use the area for breeding from late spring through summer. Although this effect would be adverse, forest cover is not a limiting factor in this area, and effects would be less than significant.

Once disposal is complete, the 22-acre disposal site would be allowed to revegetate to facilitate natural succession from pioneer plant species to mature forest habitat. A total of 8.57 acres of wetland would be permanently lost in the disposal area. This is a relatively small percentage of the wetlands at JBER. Therefore, no significant adverse effects would result to wildlife populations that rely on wetlands.

Avian species protected under the MBTA are known to nest in the disposal area, and actions that disturbed active nests or nesting avian pairs would be a violation of the MBTA. Therefore, per USFWS recommendations (Appendix B), all actions needed to clear vegetation that would serve as nesting habitat for these species within the disposal area would occur prior to the onset of the avian migration season, which is assumed to begin in early March. Once vegetation was cleared in the disposal area, there would be no nesting habitat available within the project area, substantially reducing the potential for effects to MBTA-protected species. An avian biologist would perform a pre-excavation survey of the cleared disposal area to ensure that no MBTA-protected species remained prior to its use as a disposal area.

Based on the nature of the Proposed Action and the measures taken to avoid impacts to habitat, there would be no significant impacts to wildlife.

4.7.3.2 No Action

Under the no action alternative, there would be no excavation or deposition of materials, and no removal of vegetation, therefore there would be no impacts to wildlife.

4.8 Cultural Resources

4.8.1.1 Proposed Action

There are no known archeological resources or historic properties that warrant protection inside the excavation or disposal areas. Therefore, excavation of the site is not expected to result in effects to cultural resources. However, all excavation or other ground-disturbing activities have the potential to unearth previously unrecorded or unknown cultural resources. If any potential cultural resources were discovered, including archeological artifacts or human remains, excavation activities would immediately cease at that location until the artifacts are evaluated by a cultural resources professional. Soil disturbing activities would not resume until it is determined that the materials could either be protected in place or could warrant additional preservation measures. This determination would be made in coordination with the SHPO. Any human remains discovered would be reported to the 673 ABW Cultural Resources Manager per the 673 ABW Instruction 32-7001 (PACAF 2012b).

As there are no known cultural resources onsite, effects to these resources are not anticipated as a result of operation of the disposal or excavation sites. Activities in these areas would be limited to ongoing vegetation management and possible JBER training operations. As described for the excavation period, any personnel that discover potential cultural resources at either site would cease activity and make a report to the 673 ABW Cultural Resources Manager immediately. There would be no significant impacts to cultural resources.

4.8.1.2 No Action

Under the no action alternative, there would be no excavation or deposition, therefore there would be no impacts to cultural resources.

4.9 Earth Resources

4.9.1.1 Proposed Action

The Proposed Action would result in the displacement of up to 2,000,000 cy of topsoil, which would be considered an irretrievable commitment of this resource. Therefore, there would be reduced availability of extractable topsoil for future use on JBER projects. Topsoil is not considered a limiting factor in the environmental functionality of the excavation area, and based on previously completed projects of a similar nature, the remaining topsoil would be of sufficient quality to support the vegetation community proposed for the area.

Changes in site topography may alter drainage patterns on the excavated hillside. A closure plan would be implemented as part of the Proposed Action. Erosion potential would temporarily increase until vegetation is established, but any increase in eroded topsoil would be managed behind berms that were previously installed to contain such materials. Until the vegetation community has reestablished, the control measures and BMPS described in the SWPPP prepared for this project would remain in place to ensure that impacts associated with erosion are less than significant. These measures are consistent with Alaska Department of Transportation SWPPP guidance and EPA-approved BMPs, and would include the following:

1. **Minimize amount of soil exposed during excavation.** All soil stockpiles would be covered, and exposed soils would be hydroseeded and stabilized with straw wattles as excavation-disposal phases are completed.
2. **Maintain natural buffer areas.** Natural vegetative buffer strips would be maintained where feasible to intercept and detain stormwater runoff, reduce runoff flow velocity, and promote infiltration.
3. **Control stormwater discharges and flow rates.** Storm waters potentially flowing into the project area would be diverted around exposed soil areas using ditches or berms as necessary.
4. **Protect steep slopes.** Silt fences, compost socks, or fiber rolls would be installed to contain sediments in any stormwater traveling over disturbed areas that would be discharged off-site.
5. **Storm drain inlet protection measures.** Install diversion berms to channel stormwater runoff to a highly vegetated area directly east of the disturbed area.
6. **Stabilized construction vehicle access and exit points**. Trucks and other vehicles traveling from the work area would travel over an area that is stabilized with gravel before entering and traveling over paved areas.
7. **Control dust generation and track out from vehicles**. Dust would be controlled by removing items in large pieces where possible and securing debris, and by applying water from water trucks. Also, speed would be reduced in unpaved areas.
8. **Stabilize soils**. Soil stabilization matting and mulch would be installed as needed on unvegetated cut or fill slopes.

The Proposed Action is not anticipated to result in alterations to unique or valuable geologic records or resources such as fossils, as these resources have not been identified in the project area.

With the use of the control measures described above, any potential impacts to geologic, soil, and topographic resources would be considered less than significant. There would be no significant impacts to earth resources.

4.9.1.2 No Action

No significant impacts to soils, geology, or topography are anticipated under the no action alternative, since no project would occur. Minor effects from erosion of exposed soils would occur until plant communities mature sufficiently to stabilize disturbed soils, but most eroded material would be contained by implementation of measures identified in the project SWPPP.

4.10 Socioeconomic Resources

4.10.1.1 Proposed Action

Excavation of the Proposed Action would result in minor beneficial effects on socioeconomic resources in the study area. It is expected that a portion of the implementation costs for excavation activities would be expended in the Anchorage regional economy, increasing revenues in the local construction and engineering industries for the duration of excavation. This direct benefit would also result in additional beneficial effects throughout the regional economy during this period. It would include indirect increases in revenue for suppliers to the construction and engineering industries and related increases in employee income, which is expected to result in additional spending on other goods and services in the region.

Operation of the Proposed Action would have minor beneficial effects on socioeconomic resources in the study area. Operation of the runways on JBER would be similar to the existing condition, though operations may experience minor beneficial effects in terms of efficiency due to removal of topographic obstructions and increased flexibility in runway utilization. From a regional perspective, these benefits would be negligible.

The reduced risk of air accidents would represent an indirect socioeconomic benefit. Though not readily quantified, a reduction in the likelihood of air accidents would proportionally represent a reduction in risk to human life. Such a reduction would also represent a decrease in the present value of future emergency response costs by the value of future air accident emergency response costs avoided. There would be no significant impacts to socioeconomic resources.

4.10.1.2 No Action

Under the no action alternative, there would be minor adverse effects on socioeconomic resources in the study area. Under this alternative, any hill removal activities already underway would cease. Cessation of these activities may represent a minor adverse socioeconomic effect, due a reduction in the business activity related to the ongoing work. However, these effects are judged to be less than significant within the context of the Anchorage regional economy. Therefore, no significant beneficial or adverse effects on socioeconomic resources would be expected under the no action alternative.

4.11 Transportation

4.11.1.1 Proposed Action

During excavation, use of Dena'ina Road and surrounding haul roads would be markedly increased as truck traffic would be a continual 24-hour/day presence throughout the estimated 150-day excavation periods in 2017 and 2018. Most of the excavated material (1,600,000 cy) would be transported to the

new disposal site via haul roads, including Dena'ina Road. Remaining excavated material (400,000 cy) would be deposited to the southwest of the excavated area in currently-used disposal areas that still have disposal capacity. This material would be conveyed along unnamed and unimproved disposal site roads.

Due to the large number of truck trips proposed under this alternative, additional maintenance of Dena'ina Road may be required, but it would be limited to the area between the excavation and disposal sites. Maintenance measures may include regrading, adding fill material in eroded sections, shoring up of slumps at the edge of the road, and maintaining drainage ditches on either side of the road.

Most material transport would be on specified haul routes within the site, with one crossing of Dena'ina Road just southeast of the proposed disposal site. It may be possible that the continued use of the road or maintenance activities would require temporary closures of Dena'ina Road. The crossing would be well marked with signs and lighting, and flaggers may be used as safety conditions warrant. If closure of Dena'ina Road is necessary, coordination with JBER Public Affairs and Security Forces would be conducted to minimize impacts to motorists and emergency responders. If needed, an alternate emergency service route would be identified.

Following completion of the project, operation of the site would be limited to erosion inspections, ongoing maintenance of vegetation at the excavation site to maintain Clear Zone characteristics, and the usual operational mission uses of JBER. Transportation routes would not host additional traffic beyond current levels. The use of the transportation network within the project area would not change as a result of post-excavation operations, and therefore, it would experience no effects. There would be no significant impacts to transportation resources.

4.11.1.2 No Action

Under the no action alternative, there would be no further use of the transportation network associated with the excavation project, so there would be no impacts to transportation.

4.12 Other NEPA Considerations

4.12.1 Unavoidable Adverse Effects

The Proposed Action would result in less than significant, unavoidable adverse effects to wetlands. A FONPA has been prepared in order to clarify that no practicable alternative was found to avoid or reduce effects to the wetlands in the excavation zone. There would be no significant unavoidable adverse effects to other resources. Any potential adverse effects that may result from the Proposed Action have been avoided or reduced to insignificant levels.

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

The short-term uses of the environment during excavation of the Proposed Action would result in temporary losses of resources and, overall, less than significant effects to the resources of the area. These short-term uses are necessary to achieve the long-term goals of safety and productivity of Elmendorf Airfield.

Short-term impacts are excavation-related, and include effects such as interference with local traffic and circulation, increases in ambient noise and fuel use, dust generation, disturbance of wildlife, and

increased storm runoff. These impacts would be temporary and occur only during excavation, and are therefore not expected to alter the long-term productivity of the natural environment.

In the case of wetlands, a total of 17.2 acres of wetlands would be eliminated in the short-term. However, these wetlands must be removed in order to achieve the long term safety goals, including conformance with UFC 3-260-1 and FAR Part 77.

4.12.3 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources refers to impacts on or losses of resources that cannot be reversed or recovered. The commitment of resources refers primarily to the use of nonrenewable resources such as fossil fuels, water, labor, and energy. The Proposed Action of excavating the hill to the north of Runway 16/34 and disposing of materials in the new 22-acre disposal site would result in irretrievable and irreversible losses to material goods, energy, human labor, and biological or natural resources.

Material resources to be irretrievably used for the Proposed Action would include gravel and soil used for excavation, backfilling and grading, as well as water used for dust control. These materials are readily available onsite or locally and their use does not represent a significant impact on the availability or sustainability of these resources.

Energy in the form of fossil fuels and electricity would be irreversibly used during excavation of the Proposed Action. Diesel and gasoline would be used for operation of construction equipment. Generators may be used for temporary support facilities if needed. Although use of trucks during the excavation period would be intensive, the limited period and temporary nature of excavation would not place significant demand on their availability in the region. Electricity, if needed, would be supplied by generators and would require little energy demand. Therefore, significant irreversible energy consumption impacts are not expected.

The use of human resources for project planning, excavation activities, and future operation and maintenance of the area are irretrievable losses in the sense that these personnel are precluded from participating in other work activities. However, use of human resources for the Proposed Action would represent beneficial employment opportunities and would not significantly impact the availability of construction workers for other projects in the area.

The alteration of the excavation and disposal sites would result in the irreversible loss of 17.2 acres of native, naturally formed wetlands. However, these wetlands have been classified as non-jurisdictional, meaning they are non-navigable and have no interstate commerce value. Ecologically, these isolated and small wetlands contribute minimally to the overall native wetland acreage on the base. While no net wetland losses are the goal of EO 11990, in cases where there are no practicable alternatives, and when necessary for achieving the military mission, the loss of wetlands is described in a FONPA. Overall, the loss of these wetlands would not result in a significant adverse effect to water quality, habitat availability, or aesthetic value of the area.

4.13 Cumulative Effects

CEQ regulations implementing NEPA define a cumulative impact as “the impact on the environment resulting from incremental impact of the action when added to other past, present, and reasonably

foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (CEQ, 1997). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7)."

A cumulative impact includes the total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or action of federal, non-federal, public, and private entities. Cumulative impacts may also include the effects of natural processes and events. Accordingly, there may be different cumulative impacts on different environmental resources. CEQ regulations require all federal agencies to consider the cumulative effects of all proposed agency actions.

Significant cumulative impacts occur when incremental impacts of the Proposed Action, in addition to the impacts of past, present, and reasonably foreseeable future actions would result in significant adverse impacts to resources assessed in this EA. Table 4-3 identifies past, present, and reasonably foreseeable future actions that were considered in determining whether other projects could contribute to cumulative effects.

4.13.1 Cumulative Effects for Aesthetics / Visual Resources

The geographic scope of potential cumulative impacts for visual resources includes the project area and immediate vicinity. Cumulative aesthetics impacts could occur if the proposed project and the projects identified in Table 4-3 involved actions that would affect the same visual resources, and if impacts to visual resources arising from individual projects were either long-term or their construction schedules overlap with the proposed project.

The proposed project would occur in an area that has been mostly disturbed by past actions, and which is located next to a highly developed area. Although the Proposed Action would decrease the forest cover in the area, the excavation site would naturally revegetate with a native plant community that would be consistent with other plant communities in the area. Short-term cumulative effects to aesthetic resources are anticipated in combination with the proposed F-22 Flight Operations Improvements Program, which would result in excavation of lands in the vicinity of the north hill excavation area. Although the active excavation component of these projects would not directly overlap spatially or temporally, it is unlikely that the vegetation community at the north hill excavation area would have reached maturity by the time excavation for the F-22 Flight Operations Improvements Program began. However, the plant community would likely cover most of the north hill excavation area and provide visual relief between the two projects, thereby avoiding the most substantial visual impacts that may occur if both projects were constructed at the same time. Other projects, including the proposed Wildland Fire Prevention Program, may change plant community composition, but cumulatively, these projects are not likely to cause significant impacts to visual resources in the project area.

Table 4-3: Past, Present, and Reasonably Foreseeable Projects

Action	JBER or Regional Action	Description of Action
U.S. Army Alaska Transformation	Regional	Activation of a new airborne brigade and accommodation for 4,000 more soldiers relocating from installations abroad. Included changes to force structure and modification of ranges, facilities, and infrastructure designed to meet the objectives of Army transformation in Alaska.
F-22 Plus Up	JBER	Increase the capacity of the F-22 Operational Wing at JBER with six primary aircraft and one backup aircraft; conduct flying sorties at the base and in existing Alaskan airspace for training and deployment; and implement personnel changes to conform to the F-22 Wing requirements.
Resumption of Year Round Firing Opportunities at JBER	JBER	Action would restore year-round live-fire training capabilities at Ft. Richardson in order to allow active units to achieve and maintain combat readiness, reduce deployment hardships on soldiers and their families, and reduce annual expenditures associated with travel to distant facilities for training.
Proposal to Improve F-22 Flight Operations	JBER	Proposed project would include measures to improve F-22 operations at JBER. Proposed action involves changes to existing approach and departure patterns on existing runways as well as proposals to infrastructure improvements, such as extending the existing North/South Runway at Elmendorf Airfield.
Otter Lake and Sixmile Lake Conservation Plan	JBER	Conduct watershed and fishery enhancements in the Otter Creek and Sixmile Creek watersheds at JBER, including eliminating northern pike from Otter Lake, restocking with rainbow trout, removing a fish ladder in Sixmile Creek and replacing it with a modified stream channel design to facilitate fish passage.
Chugach State Park Master Plan	Regional	Contains measures to maintain natural resources at Alaska state park located near JBER.
Joint Pacific Alaska Range Complex (JPARC)	Regional	Proposes a series of airspace and range actions to enhance individual unit and joint training in response to technological changes, lessons learned, and anticipated threats over time.
Wildland Fire Management Activities	JBER	Proposed project would implement wildland fire prevention measures within the Richardson Training Area to reduce the amount of hazardous fuels that accumulate and could contribute to uncontrollable wildfires.
Knik Arm Crossing Bridge	Regional	Proposed bridge to allow access between Anchorage and the Mat Su Borough with a bridge crossing of Knik Arm, including connections to the roadway network.

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4.13.2 Cumulative Effects for AICUZ/ Land Use / Acoustic Environment

Most of the past, present, and reasonably foreseeable actions likely involve construction activities that would temporarily elevate nearby noise levels. Other actions would be expected to implement BMPs as necessary to minimize adverse noise effects on sensitive receptors. Because the project area is relatively isolated from the main part of the base and from surrounding areas where sensitive receptors may be found, it is not likely that construction of the Proposed Action would coincide with another project in time and physical proximity such that cumulative effects would occur.

Since the proposed project would not alter authorized land uses at the site during the operations period, and would not divide an established community, it is not likely to contribute to cumulative land use impacts. Although minor effects to the AICUZ in which the project area is found would occur due to emissions of smoke and light during excavation, no other projects are likely to result in similar effects at the same time, therefore these effects would be temporary and would not contribute to significant cumulative impacts. Construction of the proposed F-22 Flight Operations Improvements Program would occur after completion of the proposed project so cumulative temporal effects to AICUZ would not occur. Long-term beneficial cumulative effects would result from implementing both the proposed project and the F-22 Flight Operations Improvements Program, as they are both intended to reduce the air accident potential.

4.13.3 Cumulative Effects for Air Quality

The geographic scope for air quality evaluation includes JBER and the City of Anchorage. Air quality in this area is influenced by stationary sources including landfills, industrial uses, and power plants, and by mobile sources such as cars, trucks, trains, and aircraft. Although JBER is considered a major source of emissions from stationary sources, air quality in and around JBER is good. JBER is in attainment for all criteria pollutants, and the surrounding areas are in attainment for all pollutants other than CO (City of Anchorage) and PM_{10} (Eagle River). The operations or occasional construction projects at JBER are not identified as a primary source of these pollutants in these municipalities.

Emissions of criteria pollutants, not including CO_2, from JBER in 2010 were over 1,170 tons/year (ADEC 2010). This total includes flight operations, which are the largest single source of emissions, as well as the other components of operations. The proposed project would add 15.7 tons of these pollutants per year, which is a minor contribution to the overall emissions total. Furthermore, these emissions would occur only over the course of one or two excavation seasons, and there would be no stationary source of emissions. Although concurrent construction projects are likely to add to the cumulative amount of emissions during excavation, the proposed project is not likely to increase cumulative emissions past threshold values, so this effect would be less than significant.

The projects identified in Table 4-3 would all contribute GHGs. GHGs would be emitted from passenger vehicles used by excavation workers and from construction equipment. Although the cumulative effect of these projects could be significant, the contribution of GHGs from the proposed project is minor and less than significant.

4.13.4 Cumulative Effects for Water Resources

All present and reasonably foreseeable projects are subject to water quality control measures specified in JBER's Storm Water Management Plan (USAF 2016f). This plan provides comprehensive planning to avoid substantial effects to water quality from construction projects and operations, and requires that a SWPPP be prepared for each construction project. Since the proposed project would not substantially increase discharges of polluted runoff to impaired receiving waters, it would not contribute to a significant cumulative effect. The proposed project would occur in the same watershed as the proposed F-22 Flight Operations Improvements Program, and long-term post-project surface water conditions at the excavation area may be influenced by changes to topography or soil conditions resulting from the F-22 Flight Operations Improvements Program. Significant cumulative impacts to storm water or soils would be avoided by preparing and implementing a SWPPP for the F-22 Flight Operations Improvements Program that takes into account downstream conditions at the north hill excavation area and incorporates the measures that were developed to control water quality and soil stability at the north hill project site.

Cumulative effects associated with loss of wetlands would be significant if the cumulative loss was a substantial portion of the wetlands found in or around JBER, or if a substantial portion of the wetlands collective functional capacity were lost. As stated in Section 4.7.2, the wetlands that would be lost as part of the proposed project would be approximately 0.3 percent of the total wetlands at JBER. Loss of wetlands from other projects identified in Table 4-3 is expected to occur, but most of the wetlands that would be lost in the vicinity of the proposed project area are likely isolated, non-jurisdictional wetlands. The proposed project is not expected to contribute to a significant cumulative effect to wetlands.

4.13.5 Cumulative Effects for Safety and Occupational Health

Cumulative adverse effects of past, present, and reasonably foreseeable actions include commonplace risks to the public and workers such as slips, trips and falls; exposure to the elements (e.g., heat and cold); interaction with wildlife such as from mosquitoes, bees, or bears; and water-related accidents such as drowning. Although these types of risks would be associated with most of the projects, they are relatively discrete, so overall cumulative effects would be negligible. The project would make a negligible contribution to cumulative effects on safety and occupational health and safety.

4.13.6 Cumulative Effects for Hazardous Materials / Waste

Most of the past, present, and reasonably foreseeable actions likely involve construction and maintenance activities that use hazardous materials and petroleum products and may generate some waste. These actions would be expected to implement BMPs and compliance measures to safely manage hazardous materials and waste and minimize adverse effects. Excavation of the proposed project would make a negligible contribution to cumulative effects on hazardous materials and waste. It is not likely that excavation of the Proposed Action would coincide with another project in time and physical proximity such that cumulative effects would occur. Likewise, excavation activities in the project area are physically separate from other portions of the installation such that there would be no cumulative effects.

4.13.7 Cumulative Effects for Biological / Natural Resources

Development of JBER as a military installation has required the removal or modification of vegetation communities and wetlands. In conjunction with development of the city of Anchorage and surrounding communities, the amount of overall native vegetation and wetlands has been diminished. To counter these effects, and in compliance with federal requirements, JBER has prepared an INRMP with the commitment to conserve vegetation and a policy of no net loss of wetlands or wetland function (USAF 2016b).

Vegetation is conserved for wildlife habitat, timber, erosion control, and military cover and concealment through surveys, monitoring, rehabilitation and effective management strategies. There would be no net loss of native vegetation as a result of the Proposed Action; vegetation in the disposal area would return over time and vegetation in the excavation area would be managed as shrub habitat.

Wetlands within the disposal site would be irretrievably lost. A FONPA has been prepared and is included in Appendix C. Although compensatory mitigation is only required for loss of jurisdictional wetlands, the INRMP notes that any net loss of wetland should be mitigated whenever possible (USAF 2016b). Although a loss of wetlands and corresponding functionality would occur in the immediate project area, this loss is a small percentage of the wetlands found at JBER, and the project's contribution to cumulative impacts would be less than significant.

Some loss of avian and wildlife habitat would occur, but effects would primarily be temporary since the project area would naturally revegetate after completion of excavation. It is likely that at least a portion of the habitat value of the excavated area would have returned by the time other large projects, including the proposed F-22 Flight Operations Improvements Program, were implemented, offsetting temporal loss of similar habitat from other projects in the vicinity. The loss of the depressional wetland in the disposal area would reduce moose foraging habitat in the area, and loss of forested cover in the area would diminish habitat quality for nesting migratory bird species. Although the historic loss of both of these types of habitat at JBER has been substantial, these habitat types are still widespread in the region and are not considered to be limiting factors for wildlife that may access them. Therefore, although the proposed project would make a cumulative contribution to this loss in combination with other projects identified in Table 4-3, the cumulative effect would be less than significant.

4.13.8 Cumulative Effects for Cultural Resources

The artifacts of the rich cultural history of the region are put at risk each time development or disturbance of the ground is undertaken. Although surveys of the site indicate that no cultural resources are present, undiscovered resources may be discovered during excavation. Excavation monitoring and adherence to Section 106 of the NHPA and JBER policy regarding cultural resources management would ensure that cultural resources that may be discovered are not lost. It is assumed that this policy applies to all projects that are in progress or that may occur in the foreseeable future. Other projects that could disturb cultural resources in the region include construction of the Knik Arm crossing and access routes to the crossing. Although the Knik Arm crossing, the proposed F-22 Flight Operations Improvements Program, and other large projects could create cumulative impacts to cultural resources on a regional scale, the Proposed Action would not likely contribute to those impacts due to a scarcity of cultural resources in the north hill excavation and disposal areas, therefore cumulative impacts to cultural resources would be less than significant.

4.13.9 Cumulative Effects for Earth Resources

Topsoil would not be exported from the project area, but would be removed from the surface of the excavation area and deposited into the deposition area, which would be an effective functional loss of much of this resource. There would be no other impacts to soils or geology, and only minor impacts to topography. The proposed F-22 Flight Operations Improvements Program, which would occur in the vicinity of the north hill excavation area, would affect topography in the area, and cause a cumulative effect in combination with the proposed project. The primary effect of altered topography would be potentially destabilized soils and altered runoff of storm water and snowmelt. These effects would be controlled by creation of a comprehensive SWPPP for the F-22 Flight Operations Improvements Program that included the measures that would be put in place to protect storm water quality and soils. In combination with BMPs incorporated into the SWPPP prepared for the proposed project, cumulative effects to soil stability and storm water quality would be less than significant.

The proposed F-22 Flight Operations Improvements Program would result in substantial excavation and export of soils from its project footprint. Soils would primarily be deposited at that JBER gravel quarry, located southeast of both the north hill and F-22 Flight Operations Improvements Program project sites. Transport and deposition of soils from these projects would not overlap spatially or temporally, therefore cumulative effects from transporting soils would be less than significant. Furthermore, excavation occurring under the proposed project would lessen the amount of soil that would need to be excavated under the proposed F-22 Flight Operations Improvements Program, so long-term cumulative effects would be reduced.

4.13.10 Cumulative Effects for Socioeconomic Resources

In combination with other proposed or ongoing construction projects, the proposed project would likely result in a minor increase in the demand for construction-related services. Although the increase in economic activity associated with these projects would only last for the duration of the excavation period, the cumulative effects would include be to increase employment in the foreseeable future. This would be a beneficial cumulative impact to the surrounding community. The proposed project would not limit or otherwise negatively affect the economy of the region, and would not contribute to significant cumulative impacts associated with socioeconomic resources.

4.13.11 Cumulative Effects for Transportation

All transportation effects, including temporary closures of haul roads used during excavation of the Proposed Action, would occur on JBER lands, primarily at the project site. Therefore, transportation effects would not contribute to overall cumulative transportation impacts to the City of Anchorage or surrounding communities. Flight glide paths for Runway 16/34 would be brought into compliance with safety standards. Both the proposed project and the proposed F-22 Flight Operations Improvements Program would increase flight safety of multiple runways and would contribute to a cumulative improvement in flight patterns for the region.

4.14 Potential Mitigation Measures (As Required)

This section identifies BMPs and measures that are recommended to minimize potential environmental consequences of the Proposed Action to the degree possible. In some instances, the same BMPs or conservation measures are applied to multiple resource categories.

Acoustic Environment

- Workers would wear adequate hearing protection as appropriate and in accordance with the project health and safety plan and applicable occupational health and safety regulations.

Air Quality

- Soil stockpiles would be covered.
- Apply water from water trucks to excavation areas, access and haul roads, and staging areas as needed to control fugitive dust.
- Set a low speed limit on access roads to reduce dust generation.
- Restrict idling of construction vehicles and machinery to a maximum of 5 minutes.

Water Resources

- Implement BMPs identified in the project-specific SWPPP.

Safety and Occupational Health

- Comply with OSHA and site BMPs for worker safety.

Hazardous Materials/Waste

- Comply with standards identified in JBER OPLAN 19-3 EMP.

Biological Resources

- Perform surveys for active nests.
- If bald eagle nests are identified in the project area, maintain a buffer of at least 660 feet from the edge of the excavation area, and avoid extremely loud noises within 0.5 mile of bald eagle nests.

Cultural Resources

- Stop work and notify cultural resources professional in case of inadvertent discovery of cultural or historic resources.

Earth Resources

- Minimize amount of soil exposed during excavation. All soil stockpiles would be covered, and exposed soils would be stabilized as excavation-disposal phases are completed.
- Maintain natural buffer areas. Natural vegetative buffer strips would be maintained where feasible to intercept and detain stormwater runoff, reduce runoff flow velocity, and promote infiltration.

- Control stormwater discharges and flow rates. Storm waters potentially flowing into the project area would be diverted around exposed soil areas using ditches or berms as necessary.
- Protect steep slopes. Silt fences, compost socks, or fiber rolls would be installed to contain sediments in any stormwater traveling over disturbed areas that would be discharged off-site.
- Storm drain inlet protection measures. Install diversion berms to channel stormwater runoff to a highly vegetated area directly east of the disturbed area.
- Stabilized construction vehicle access and exit points. Trucks and other vehicles traveling from the work area would travel over an area that is stabilized with gravel before entering and traveling over paved areas.
- Control dust generation and track out from vehicles. Dust would be controlled by removing items in large pieces where possible and securing debris, and by applying water from water trucks. Also, speed would be reduced in unpaved areas.
- Stabilize soils. Soil stabilization matting and mulch would be installed as needed on unvegetated cut or fill slopes.

Transportation

- Install signs alerting drivers to presence of machinery.
- Employ flaggers if needed to control traffic.
- Maintain Dena'ina Road as needed to ensure trucks and other vehicles have safe conditions.

5 List of Preparers

Name	Affiliation	Years of Experience	Degrees	EA Responsibility
Emmy Andrews	Tetra Tech	10	MS, 2005, Environmental Management, University of San Francisco BA, 1998, Art and Art History, Duke University	Noise, AICUZ, Public Health and Safety, Hazardous Materials
Sara Townsend	Tetra Tech	20	MS, 2000, Wildlife Ecology and Conservation, University of Florida BS, 1996, Watershed Studies, Western Washington University	Biological Resources, Cultural Resources, Aesthetics, Transportation
Chuck Kirchner	Tetra Tech	40	MA, 1974, Urban Affairs, St. Louis University BA 1973, Public Affairs, Seattle University	Purpose and Need, Project Description, QA/QC
James Carney	Tetra Tech	7	BA, 2008, Environmental Economics, University of Washington	Socioeconomics, Environmental Justice, GIS
Merri Martz	Tetra Tech	24	MMA, 1993, Marine Affairs, Wetland Ecology, University of Washington MS, 1990, Marine Natural Products, Chemistry, University of California, Santa Cruz BS, 1988, Chemistry/Biology, Pacific Union College	QA/QC
David Munro	Tetra Tech	18	B.A. 1989. Psychology. Sacramento State University M.A. 2001, Natural Resource Management, San Francisco State University	Project Management, Water Resources, Earth Resources, Air Quality, Land Use

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6 Agencies Contacted/Coordinated With

Alaska Department of Environmental Quality

Alaska Department of Environmental Conservation

Alaska Department of Fish and Game

Alaska Department of Natural Resources

National Marine Fisheries Service, Protected Resources Division

U.S. Department of Interior, Office of Environmental Policy & Compliance

Bureau of Land Management, Anchorage Field Office

U.S. Fish and Wildlife Service, Anchorage Fish & Wildlife Field Office

Municipality of Anchorage

Ted Stevens International Airport

Federal Aviation Administration

Community Councils Center

Eklutna Incorporated

Native Village of Eklutna

Chickaloon Village Traditional Council

Knik Village

Native Village of Tyonek

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7 References

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DRAFT 1

1. COMPONENT	FY 2015 PROJECT DATA	2. DATE
AIR FORCE	(computer generated)	

3. INSTALLATION, SITE AND LOCATION	4. PROJECT TITLE
JOINT BASE ELMENDORF-RICHARDSON ELMENDORF AFB SITE #1 ALASKA	AIRFIELD OBSTRUCTION REMOVE HILL NORTH END RNWY 34/16 PHASE2

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. RPSUID/PROJECT NUMBER	8. PROJECT COST ($000)
22178	111-111	1821/FXSB113014B	EEIC 52100 9,000

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT	COST
PRIMARY FACILITIES				9,000.0
REMOVE RUNWAY OBSTRUCTION (UM IS 1,000 CY)	CY	*********	2	(9,000.0)
SUBTOTAL				9,000.0
PROFIT AND OVERHEAD				0.0
TOTAL FUNDED COST				9,000.0
UNFUNDED COST				0.0
TOTAL REQUEST				9,000.0

10. Description of Proposed Work: Excavate the existing hill obstruction at the north end of the existing runway 16-34 to comply with the Unified Facility Criteria (UFC) 3-260-01, AIRFIELD AND HELIPORT PLANNING AND DESIGN, dated, 18 NOV 2008 for Air Force Class B runway, 50H:1V Slope Ratio specified in Figure 3-15, Class B Army and Air Force Runway Airspace Plan and Profile Runway Imaginary Surfaces and the 50H:1V, Approach-Departure Clearance Surface specified in Figure 3-13, Class B, Army and Air Force Runway End Clear Zone Details. The area to be removed has a volume of ~2,440,476 CY.

11. Requirement: As Required.

PROJECT: Excavation and relocation of earth at the north end of Runway 34/16 to meet clear guide slope of 40:1 minimum 50:1 optimum. The area to be removed has a volume of ~2,440,476 CY. This is Phase 2 of a multiphase project.

REQUIREMENT: Excavate soil to comply with the required 50H:1V Approach-Departure Clearance Surface specified in the aforementioned UFC.

CURRENT SITUATION: Runway 16-34 does not comply with the required 50H:1V Approach-Departure Clearance Surface Slope Ratio as there is an existing hill obstruction; therefore, becoming a safety hazard and concern for pilots and passengers that may utilize runway 16-34.

IMPACT IF NOT PROVIDED: Due to the hill obstruction the North/South runway is restricted by the FAA that has issued NOTAMS that Runway 16 is not recommended for jet aircraft except daytime VFR due to obstruction. TERPS minimum is 40:1 surface (the 50:1 requirement of the UFC 3-260-01 is even more severe). Issues include the current use of the south overrun for take-offs (500 ft displaced threshold) required for fully loaded aircraft; risky long landings on the 16 approach (touchdown near the 6-24 intersection); and high hazards when on a 34 approach due to high volume general aviation traffic when intersecting through Merrill field airspace.

10 Jun 2016

Michael E. Schmidt
Deputy Commander, 673 CES

1. COMPONENT	FY 2011 PROJECT DATA	2. DATE
AIR FORCE	(computer generated)	

3. INSTALLATION, SITE AND LOCATION	4. PROJECT TITLE
JOINT BASE ELMENDORF-RICHARDSON ELMENDORF AFB SITE #1 ALASKA	AIRFIELD OBSTRUCTION REMOVE HILL NORTH END RUNWAY 34/16

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. RPSUID/PROJECT NUMBER	8. PROJECT COST ($000)
22178	912-261	1821/FXSB113014	EEIC 52400 18,768.8

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT	COST
PRIMARY FACILITIES				17,875.0
EXCAVATION & HAUL TO STAGING SITE	CY	*********	3	(17,875.0)
SUBTOTAL				17,875.0
CONTINGENCY (5.0%)				893.8
PROFIT AND OVERHEAD (.0%)				0.0
TOTAL FUNDED COST				18,768.8
UNFUNDED COST (.0%)				0.0
TOTAL REQUEST				18,768.8

10. Description of Proposed Work: Excavate the existing hill obstruction at the north end of the existing runway 16-34 to comply with the Unified Facility Criteria (UFC) 3-260-01, AIRFIELD AND HELIPORT PLANNING AND DESIGN, dated, 18 NOV 2008 for Air Force Class B runway, 50H:1V Slope Ratio specified in Figure 3-15, Class B Army and Air Force Runway Airspace Plan and Profile Runway Imaginary Surfaces and the 50H:1V, Approach-Departure Clearance Surface specified in Figure 3-13, Class B, Army and Air Force Runway End Clear Zone Details.

11. Requirement: 125200 SY Adequate: 0 SY Substandard: 125200 SY

PROJECT: Excavate hill north off runway 16-34 to comply with aforementioned UFC. This is an umbrella DD1391. Project will be completed in phases.

REQUIREMENT: Excavate soil and haul to designated staging site and comply with the required 50H:1V Approach-Departure Clearance Surface specified in the aforementioned UFC.

CURRENT SITUATION: The current situation is that runway 16-34 does not comply with the required 50H:1V Approach-Departure Clearance Surface Slope Ratio as there is an existing hill obstruction; therefore, becoming a safety hazard and concern for pilots and passengers that may utilize runway 16-34

IMPACT IF NOT PROVIDED: If not provided the existing aircraft on approach or departure might collide into the existing hill obstruction, which is a major safety issue for pilots and their passengers attempting to use runway 16-34 at Joint Base Elmendorf-Richardson, Alaska.

JOINT USE CERTIFICATION: This facility is programmed for joint use with other DoD services and commercial carriers; however, it is proposed to be funded by the Air Force with Operations and Maintenance funds.

14 AUG 2010

Michael E. Schmidt
Deputy Commander, 673 CES

673 ROUTING SLIP

SUBJECT: Authorize Project to Remove Obstruction (Hill) North of Runway 34/16.

Please sign both DD1391s -

-One is Umbrella for whole project

-2nd is Increase for Phase 2 so RED HORSE can request funds for next Phase using same project already underway

OPR:

OFC	COORD	ACTION	INITIAL/DATE
CENPD	X		WJR / 2016 07 29
CEN	X		RJO / 2016 08 01
673 CES/CCS			
673 CES/CD		Sign	2 Aug 16
673 CES/CC			
673 CEG/CCS			
673 CEG/CD			
673 CEG/CC			

Approval Limits 521 Maintenance
673 CES/CEN $2M, 673 CES/CD $Unlmt

RETURN TO: Barb Corona

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MAY 31 2011

MEMORANDUM FOR PACAF/CV

FROM: 673 ABW/CC
10471 20th Street, Suite 139
JBER AK 99506-2200

SUBJECT: Submittal Approval for Waiver Request Package for Hill Obstruction on North End of Runway 16/34

Reference: UFC 3-260-01 Airfield and Heliport Planning and Design, PACAFI 32-1056 Airfield Planning and Design

1. The Airfield Traffic System Evaluation Report (ATSEP), July 2010, identified as a checklist item the need for analysis of the terrain at the north end of Runway 16/34 against the 50:1 approach/departure clearance surfaces and associated operational impacts. After evaluation, the hill at the north end of Runway 16/34 has been identified as an obstruction due to its height penetrating the 50:1 glide slope for approach-departure clearance surface. A waiver request package has been prepared to address this obstruction.

2. Per UFC 3-260-01 Airfield and Heliport Planning and Design, and PACAFI 32-1056 Airfield Planning and Design, this memo is confirm that required installation coordination has been completed, necessary installation level approval has been obtained and the waiver request package is ready for submittal to PACAF/CV for approval.

3. If you have any questions regarding this request, please contact Mrs. Mary Dougan, 673 CES/CEAOP, DSN 317- 384-3285, or Mr. KC Cramer, 3 OSS/OSAM, DSN 317-552-2444.

ROBERT D. EVANS
Colonel, USAF
Commander

4 Attachments
1. Airfield Waiver Request Memo
2. Airfield Waiver with Signature Page
3. Airfield Waiver Map
4. Operational Risk Assessment

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

MEMORANDUM FOR PACAF/CV

FROM: 3 WG/CC
11550 Heritage Circle Suite 200
JBER AK 99506-2850

SUBJECT: Waiver for Hill Obstruction on North End of Runway 16/34

Reference: UFC 3-260-01 Airfield and Heliport Planning and Design

1. Request waiver to criteria in UFC 3-260-01, table 3-7, item 7 Surface: Approach-Departure Clearance Surface (Sloped).

2. The Airfield Traffic System Evaluation Report (ATSEP), July 2010, identified as a checklist item the need for analysis of the terrain at the north end of runway 16/34 against the 50:1 approach/departure clearance surfaces and associated operational impacts. After evaluation, the hill at the north end of Runway 16/34 has been identified as an obstruction due to its height penetrating the 50:1 glide slope for approach-departure clearance surface. The impacts of the obstruction include a 500' displaced threshold onto the south overrun for fully loaded aircraft take-offs; long landings on the 16 approach forcing touchdown near the 6/24 intersection; and high hazards when on a 34 approach due to high volume general aviation traffic when intersecting through Merrill field airspace. The FAA has issued NOTAMS that Runway 16 is not recommended for jet aircraft except daytime VFR due to the obstruction. Airfield Operations has published flight restrictions IAW PACAF/TERPS assessments to restrict specific aircraft operations on Rwy 16/34.

3. Under the Airfield Obstruction Reduction Initiative (AORI), funding for an excavation project to reduce the elevation of the hill has been requested. An agreement with the Port Of Anchorage to excavate portions of the hill to the required 50:1 slope in exchange for the fill for use in the Port expansion project is also being negotiated. The timeline and completion are contingent upon funding obtained by the Port.

4. If you have any questions regarding this request, please contact Mrs. Mary Dougan, 673 CES/CEAOP, DSN 317- 384-3285, or Mr. KC Cramer, 3 OSS/OSAM, DSN 317-552-2444.

JOHN K. McMULLEN
Colonel, USAF
Commander

3 Attachments:
1. Airfield Waiver with Signature Page
2. Airfield Waiver Map
3. Operational Risk Assessment

AIRFIELD/AIRSPACE CRITERIA VIOLATION

Date **19 April 2011**

Form 48

Base/Installation **Elmendorf AFB**

Approved By:

Date	Wing Commander	Signature
	for Col. J.K. McMullen	
Date	Operations Group Commander	Signature
Date	Safety Authority	Signature
28 Apr 11		
Date	Airfield Management	Signature
	Kevin A. Cramer, GS-12, DOD	
Date	Terminal Procedure Personnel	Signature
Date	Base Civil Engineer	Signature
28 Apr 11	RUSSELL R. HULA, Colonel, USAF	

AIRFIELD/AIRSPACE CRITERIA VIOLATION

Date **19 April 2011**

Form 48

Base/Installation **Elmendorf AFB**

Approved By:

Date	Wing Commander	Signature
Date	Operations Group Commander	Signature
Date	Safety Authority	Signature
Date	Airfield Management	Signature
Date 10MAY11	Terminal Procedure Personnel THOMAS R SETERA PACAF TERPS	Signature
Date	Base Civil Engineer	Signature

Waiver ID	Obstruction ID	Type/ Status/ Disposition	Obstruction Description	Regulation Table No./Item No./Par. No. Surface Violated	Extent of Violation (Ft.)	Proposed Corrective Actions / Remarks
R16/34-19	FXSBPAED0343	Type: WAIVER Status: PROPOSED Disposition: PROPOSED	Hill Obstruction Frangible: NO In Frang. Zone: YES Priority Area: PA1	Regulation: UFC 3-260-01, table 3-7, item 7 Surface: Approach-Departure Clearance Surface (Sloped)	Vert. Violation: C: 254 A: 374 V: 120	Actions: Hill is being leveled to lower the elevation. FXSB113014 will allow excavation of hill to a minimum of 40:1 up to the optimum 50:1 glide slope. Remarks: Waiver request pending.
			Description= building#, sign, bollard, tree, NAVAID... Frangible= Y/N In Frangibility Zone= Y/N Priority Area= 1, 2, 3 or blank	Regulation= UFC 3-260-01, ... Surface Violated= clear zone, runway lateral clearance, glide slope, lateral slope, wingtip clearance, ...	Dimensions= Allowable distance between obstruction and surface, actual distance, and difference between	Proposed corrective actions/remarks: Need to state if permanent or temporary waiver, correctable or non-correctable, permissible deviation. If correctable, need to list project, program year and funding needed for correction (obstruction removal ,adding frangibility, ?)

R16-34-19

- AIRFIELD OBSTRUCTIONS
- AIRFIELD IMAGINARY SURFACES
- APPROACH-DEPARTURE
- CONICAL SURFACE
- INNER HORIZONTAL SURFACE
- OUTER HORIZONTAL SURFACE
- PRIMARY SURFACE
- TRANSITIONAL SURFACE
- INSTALLATION AREA
- TOPOGRAPHIC LINES
- FUEL TANKS
- BUILDINGS
- STATIC DISPLAY AIRCRAFT
- SLABS
- AIRFIELD MARKING LINES
- ROAD AREAS
- ROAD CENTERLINES
- RAILROADS
- AIRFIELD AREA
- RUNNING TRACK
- SIDEWALKS
- PARKING LOTS
- DRIVEWAYS
- ATHLETIC COURTS
- ATHLETIC FIELDS
- WATERBODIES
- STREAMS
- GOLF COURSE BUNKERS
- GOLF COURSE PUTTING GREENS
- GOLF COURSE FAIRWAYS
- LAND

Scale: 1:8,371

PACAF 2006.

2011 HILL NORTH OF RWY 34/16 WAIVER
OPERATIONAL RISK ASSESSMENT

Operation Assessed: Hill located north of Runway 34/16.

Individual Performing Assessment: 3 OSS/OSAM
Report Date: 21 January 2011
Overall Risk Level: **High**

Assessment Details:
A 374' hill is currently located approximately 1,000' North of Runway 16/34. This hill violates the 50:1 Approach/Departure Clearance Zone and falls within the Clear Zone as identified in UFC 3-260-01.

Risk Assessment Matrix

		Probability				
Severity		Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
Catastrophic	I	Extremely				
Critical	II	High	High			
Moderate	III		Medium		Low	
Negligible	IV					
Risk Levels						

Risk Assessment Matrix Key

Severity
Catastrophic I = Mission Failure, Loss of System / $1,000,000. Damage, Death, Permanent Total Disability
Critical II = Mission Degradation, Major Damage / $200,000.-$1,000,000., Severe Injury, Partial Disability
Moderate III = Minor Mission Degradation, Minor Damage / $10,000.-$200,000., Injury, Lost Work Day
Negligible IV = Low Mission Degradation, Limited Damage / $10,000.- or Less, Occupational Illness

Probability
Frequent = Mishap will occur immediately, continuously, often, if hazard is not corrected
Likely = Mishap is likely to occur in time, frequently, if hazard is not corrected
Occasional = Mishap is possible to occur in time, periodically, sporadically, if hazard is not corrected
Seldom = Mishap could occur at some point in life cycle of process, seldom, if hazard is not corrected
Unlikely = Mishap is unlikely to occur, should not occur, rarely occurs, if hazard is not corrected

Hazard Description & Residual Risk:

Hazard	Hazard & Cause	Severity	Probability	Risk
# 1	In-Flight Emergencies	Catastrophic	Seldom	**High**

Hazard Risk Control Measures:

Hazard #	Control	Original Risk	Controlled Risk
# 1	Airfield Operations has published flight restrictions IAW PACAF/TERPS assessments to restrict specific aircraft operations on Rwy 16/34. There is also an on-going contract to reduce the elevation of the hill with the Anchorage Port Authority that is contingent upon yearly funding.	**High**	Low

Control Recommendations:

Based on the impact to the overall risk level, mission-supportiveness, control compatibility, synergy, and anticipated cost versus benefit, the following controls are recommended as a result of this ORM assessment:

1. Airfield Operations Flight personnel will follow all OI/WG OI, Flight Publications, and Operational Checklists.

2. Airfield Operations Flight personnel will ensure aircraft follow all Air Traffic Control and Flight Crew Information File instructions.

OVERALL RISK LEVEL BEFORE CONTROL MEASURES:	***High***
OVERALL RISK LEVEL IF CONTROL MEASURES ARE IMPLEMENTED:	***Low***

Appropriate Decision Level:

Considering the potential cost of implementation and overall mission/operation accountability, the appropriate decision maker/approval authority for these controls is:	3 OSS/OSA (AOF/CC)

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	3 WG/CC	Sign	Col 18MAY11	6	3 OSS/CC	Coord	Greenlee, Paul, Lt Col, 28 APR11
2	3 WG/CV	Coord	HARTSOCK, Col 9 May11	7	3 OSS/ OSA	Coord	HARENCAK, MEGAN, 28Apr11
3	3 WG/CCE	Info	DONOHUE, MARK, O-4 9 MAY 11	8	PACAF/ TERPS	Sign	see attached
4	3 WG/SEF	Sign	Anthony Curtis 28Apr11	9	3 OSS/ OSAM	Sign	28APR
5	3 OG/CC	Sign	Col	10	673 CEG/ CC	Sign	Col, 28Apr

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Mrs. Dougan, GS-12	673 CES/CEAOP	384-3285	mjd	

SUBJECT	DATE
Airfield/Airspace Criteria Violation Waiver for Hill Obstruction	20110419

SUMMARY

1. PURPOSE: Obtain 3 WG/CC, 3 WG/SEF, 3 OG/CC, PACAF TERPS, 3 OSS/OSAM, and 673 CEG/CC signatures to Airfield/Airspace Criteria Violation Waiver Package, PACAF Form 48 (Tab 2), with attached map of the airfield and associated obstruction (Tab 3) and operational risk assessment (Tab 4) and 3 WG/CC signature to waiver memo (Tab 1).

2. BACKGROUND: IAW UFC 3-260-1 , Airfield and Heliport Planning and Design, and PACAFI 32-1056, Airfield Planning and Design, 673 CES is submitting this package as a mandatory requirement for airfield obstructions. After installation coordination and supported commander approval is obtained, the package will be forwarded to HQ PACAF A7P for coordination and approval by HQ PACAF/CV. Due to the command structure of Joint Base Elmendorf-Richardson (JBER), the supported commander (3 WG) is responsible for obtaining approval from PACAF for waivers and the supporting commander (673 ABW) is responsible for local coordination. A separate Staff Summary Sheet will be prepared for the 673 ABW, upon completion of the staffing through 3 WG, to include a memo to PACAF for documentation of local approval and coordination.

3. DISCUSSION: The Airfield Traffic System Evaluation Report (ATSEP), July 2010, identified as a checklist item the need for analysis of the terrain at the north end of runway 16/34 against the 50:1 approach/departure clearance surfaces and associated operational impacts. After evaluation, the hill at the north end of Runway 16/34 has been identified as an obstruction due to its height penetrating the 50:1 guide slope for approach-departure clearance surface. The impact to mission, the implemented control measures, and the plan for obstruction removal are identified in the waiver memo (Tab 1).

4. RECOMMENDATION: Designated individuals sign PACAF Form 48 signature page at Tab 2 and 3 WG/CC also sign waiver memo at Tab 1.

J. DAVID NORTON, Lt Col, USAF
Commander

4 Tabs
1. Waiver Memo
2. PACAF Form 48
3. Airfield Map
4. Operational Risk Assessment

WG-485

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	3 WG/CC	Sign		6	3 OSS/CC	Coord	
2	3 WG/CV	Coord		7	3 OSS/ OSA	Coord	
3	3 WG/CCE	Info		8	PACAF/ TERPS	Sign	10 MAY 11
4	3 WG/SEF	Sign		9	3 OSS/ OSAM	Sign	
5	3 OG/CC	Sign		10	673 CEG/ CC	Sign	

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Mrs. Dougan, GS-12	673 CES/CEAOP	384-3285	mjd	

SUBJECT	DATE
Airfield/Airspace Criteria Violation Waiver for Hill Obstruction	20110419

SUMMARY

1. PURPOSE: Obtain 3 WG/CC, 3 WG/SEF, 3 OG/CC, PACAF TERPS, 3 OSS/OSAM, and 673 CEG/CC signatures to Airfield/Airspace Criteria Violation Waiver Package, PACAF Form 48 (Tab 2), with attached map of the airfield and associated obstruction (Tab 3) and operational risk assessment (Tab 4) and 3 WG/CC signature to waiver memo (Tab 1).

2. BACKGROUND: IAW UFC 3-260-1 , Airfield and Heliport Planning and Design, and PACAFI 32-1056, Airfield Planning and Design, 673 CES is submitting this package as a mandatory requirement for airfield obstructions. After installation coordination and supported commander approval is obtained, the package will be forwarded to HQ PACAF A7P for coordination and approval by HQ PACAF/CV. Due to the command structure of Joint Base Elmendorf-Richardson (JBER), the supported commander (3 WG) is responsible for obtaining approval from PACAF for waivers and the supporting commander (673 ABW) is responsible for local coordination. A separate Staff Summary Sheet will be prepared for the 673 ABW, upon completion of the staffing through 3 WG, to include a memo to PACAF for documentation of local approval and coordination.

3. DISCUSSION: The Airfield Traffic System Evaluation Report (ATSEP), July 2010, identified as a checklist item the need for analysis of the terrain at the north end of runway 16/34 against the 50:1 approach/departure clearance surfaces and associated operational impacts. After evaluation, the hill at the north end of Runway 16/34 has been identified as an obstruction due to its height penetrating the 50:1 guide slope for approach-departure clearance surface. The impact to mission, the implemented control measures, and the plan for obstruction removal are identified in the waiver memo (Tab 1).

4. RECOMMENDATION: Designated individuals sign PACAF Form 48 signature page at Tab 2 and 3 WG/CC also sign waiver memo at Tab 1.

J. DAVID NORTON, Lt Col, USAF
Commander

4 Tabs
1. Waiver Memo
2. PACAF Form 48
3. Airfield Map
4. Operational Risk Assessment

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	673 ABW/ CC	Sign	3 MAY 11 EVANS OC	6	673 CEG/ CC	Coord	R. Hula, Col, 10 May
2	673 ABW/ CV	Coord		7	673 CEG/ CD (BCE)	Coord	Ade Concur 10 May 11
3	673 ABW/ CS	Coord	Wulut 5/25/11	8			
4	673 ABW/ CCE	Info	N. Hardy 5/26/11	9			
5	673 SFS/ S5PN	Coord	Concur - no issues w/ Security CMSgt C. Carver, MSgt, USAF 23 May 11	10			

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Mrs. Dougan, GS-12	673 CES/CEAOP	384-3285	mjd	

SUBJECT	DATE
Airfield/Airspace Criteria Violation Waiver for Hill Obstruction	20110516

SUMMARY

1. PURPOSE: Obtain 673 ABW/CC signature on transmittal memo at Tab 1.

2. BACKGROUND: The Airfield Traffic System Evaluation Report (ATSEP), July 2010, identified as a checklist item the need for analysis of the terrain at the north end of runway 16/34 against the 50:1 approach/departure clearance surfaces and associated operational impacts. After evaluation, the hill at the north end of Runway 16/34 has been identified as an obstruction due to its height penetrating the 50:1 glide slope for approach-departure clearance surface. The impact to mission, the implemented control measures, and the plan for obstruction removal are identified in the waiver memo (Tab 2). Tabs 3 - 5 are required sections of the waiver request package.

3. DISCUSSION: IAW UFC 3-260-1 , Airfield and Heliport Planning and Design, and PACAFI 32-1056, Airfield Planning and Design, 673 CES is submitting this package as a mandatory requirement for airfield obstructions. The supported commander, 3 WG, approval has been obtained. After completion of installation coordination, the package will be forwarded to HQ PACAF A7P for coordination and approval by HQ PACAF/CV. PACAFI 32-1056 requires a memo from the installation commander stating the waiver package has been locally coordinated and is ready for submittal.

4. RECOMMENDATION: 673 ABW/CC sign memo at Tab 1 as concurrence that the waiver package has been coordinated and approved for submission by way of the waiver memo (Tab 2) and the 3 WG staff summary sheet (Tab 6).

J. DAVID NORTON, Lt Col, USAF
Commander

6 Tabs
1. Transmittal Memo
2. Waiver Memo
3. PACAF Form 48
4. Airfield Map
5. Operational Risk Assessment
6. 3 WG Staff Summary Sheet

No 346 11-3-24-11

Appendix B: Interagency/Intergovernmental Coordination Letters for Environmental Planning, Government to Government Letters, and Responses

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

24 FEB 2017

MEMORANDUM FOR CHICKALOON VILLAGE TRADITIONAL COUNCIL
ATTN: MR. GARRY HARRISON

FROM: 673 ABW/CC
10471 20th Street, Suite 139
JBER AK 99506-2200

SUBJECT: Government-to-Government Communications Query regarding Environmental Assessment for North Runway Hill Removal Project at Joint Base Elmendorf-Richardson (JBER)

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an Environmental Assessment (EA) to analyze the potential impacts on the human environment from the extraction and disposal of soil north of Runway 16/34 at JBER. The proposed action is needed to bring flight operations at Elmendorf Airfield, using Runway 16/34, into conformance with Unified Facilities Criteria (UFC) 3-260-01 and Federal Aviation Regulations (FAR) Part 77. Currently, Runway 16/34 is in non-compliance due to a topographic feature (a hill) which obstructs the 50:1 glide slope requirement for Class B runways, posing a safety risk for departing and arriving aircraft.

2. Please let us know if you have any general concerns that could be addressed in the EA. If you believe this proposal will significantly affect any tribal right(s) or protected resource(s), we invite you to consult with us on a government-to-government basis, in accordance with the U.S. Department of Defense *American Indian and Alaska Native Policy* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Please write to us and explain which tribal right(s) or protected tribal resource(s) will be affected and how they will be significantly affected. To initiate consultation, please contact Mr. Jon Scudder, Cultural Resources Program Manager, at (907) 384-6648 or jon.scudder@us.af.mil to determine a time which may be mutually convenient. Please provide your comments or requested information not later than 20 March 2017 in order to be considered during the preparation of the EA.

3. The USAF will publish a notice of availability (NOA) of the EA and draft Finding of No Significant Impact (FONSI) in the Anchorage Daily News and on the JBER website (http://www.jber.af.mil/environmental/index.asp). The NOA will initiate the public comment period and explain the method for submitting comments on the EA and draft FONSI.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.25@us.af.mil. An alternate point of contact is Mr. Brent Koenen, Chief of Natural Resources and Conservation, at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

GEORGE T.M. DIETRICH III
Colonel, USAF
Commander

Attachment:
Map of Proposed Alternative

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

24 FEB 2017

MEMORANDUM FOR THE NATIVE VILLAGE OF EKLUTNA
ATTN: MR. LEE STEPHAN

FROM: 673 ABW/CC
10471 20th Street, Suite 139
JBER AK 99506-2200

SUBJECT: Government-to-Government Communications Query regarding Environmental Assessment for North Runway Hill Removal Project at Joint Base Elmendorf-Richardson (JBER)

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an Environmental Assessment (EA) to analyze the potential impacts on the human environment from the extraction and disposal of soil north of Runway 16/34 at JBER. The proposed action is needed to bring flight operations at Elmendorf Airfield, using Runway 16/34, into conformance with Unified Facilities Criteria (UFC) 3-260-01 and Federal Aviation Regulations (FAR) Part 77. Currently, Runway 16/34 is in non-compliance due to a topographic feature (a hill) which obstructs the 50:1 glide slope requirement for Class B runways, posing a safety risk for departing and arriving aircraft.

2. Please let us know if you have any general concerns that could be addressed in the EA. If you believe this proposal will significantly affect any tribal right(s) or protected resource(s), we invite you to consult with us on a government-to-government basis, in accordance with the U.S. Department of Defense *American Indian and Alaska Native Policy* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Please write to us and explain which tribal right(s) or protected tribal resource(s) will be affected and how they will be significantly affected. To initiate consultation, please contact Mr. Jon Scudder, Cultural Resources Program Manager, at (907) 384-6648 or jon.scudder@us.af.mil to determine a time which may be mutually convenient. Please provide your comments or requested information not later than 20 March 2017 in order to be considered during the preparation of the EA.

3. The USAF will publish a notice of availability (NOA) of the EA and draft Finding of No Significant Impact (FONSI) in the Anchorage Daily News and on the JBER website (http://www.jber.af.mil/environmental/index.asp). The NOA will initiate the public comment period and explain the method for submitting comments on the EA and draft FONSI.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.25@us.af.mil. An alternate point of contact is Mr. Brent Koenen, Chief of Natural Resources and Conservation, at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

GEORGE T.M. DIETRICH III
Colonel, USAF
Commander

Attachment:
Map of Proposed Alternative

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

24 FEB 2017

MEMORANDUM FOR THE KNIK VILLAGE
ATTN: MS. DEBRA CALL

FROM: 673 ABW/CC
10471 20th Street, Suite 139
JBER AK 99506-2200

SUBJECT: Government-to-Government Communications Query regarding Environmental Assessment for North Runway Hill Removal and Project at Joint Base Elmendorf-Richardson (JBER)

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an Environmental Assessment (EA) to analyze the potential impacts on the human environment from the extraction and disposal of soil north of Runway 16/34 at JBER. The proposed action is needed to bring flight operations at Elmendorf Airfield, using Runway 16/34, into conformance with Unified Facilities Criteria (UFC) 3-260-01 and Federal Aviation Regulations (FAR) Part 77. Currently, Runway 16/34 is in non-compliance due to a topographic feature (a hill) which obstructs the 50:1 glide slope requirement for Class B runways, posing a safety risk for departing and arriving aircraft.

2. Please let us know if you have any general concerns that could be addressed in the EA. If you believe this proposal will significantly affect any tribal right(s) or protected resource(s), we invite you to consult with us on a government-to-government basis, in accordance with the U.S. Department of Defense *American Indian and Alaska Native Policy* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Please write to us and explain which tribal right(s) or protected tribal resource(s) will be affected and how they will be significantly affected. To initiate consultation, please contact Mr. Jon Scudder, Cultural Resources Program Manager, at (907) 384-6648 or jon.scudder@us.af.mil to determine a time which may be mutually convenient. Please provide your comments or requested information not later than 20 March 2017 in order to be considered during the preparation of the EA.

3. The USAF will publish a notice of availability (NOA) of the EA and draft Finding of No Significant Impact (FONSI) in the Anchorage Daily News and on the JBER website (http://www.jber.af.mil/environmental/index.asp). The NOA will initiate the public comment period and explain the method for submitting comments on the EA and draft FONSI.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.25@us.af.mil. An alternate point of contact is Mr. Brent Koenen, Chief of Natural Resources and Conservation, at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

GEORGE T.M. DIETRICH III
Colonel, USAF
Commander

Attachment:
Map of Proposed Alternative

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

24 FEB 2017

MEMORANDUM FOR THE NATIVE VILLAGE OF TYONEK
ATTN: MR. FRANK STANDIFER

FROM: 673 ABW/CC
10471 20th Street, Suite 139
JBER AK 99506-2200

SUBJECT: Government-to-Government Communications Query regarding Environmental Assessment for North Runway Hill Removal Project at Joint Base Elmendorf-Richardson (JBER)

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an Environmental Assessment (EA) to analyze the potential impacts on the human environment from the extraction and disposal of soil north of Runway 16/34 at JBER. The proposed action is needed to bring flight operations at Elmendorf Airfield, using Runway 16/34, into conformance with Unified Facilities Criteria (UFC) 3-260-01 and Federal Aviation Regulations (FAR) Part 77. Currently, Runway 16/34 is in non-compliance due to a topographic feature (a hill) which obstructs the 50:1 glide slope requirement for Class B runways, posing a safety risk for departing and arriving aircraft.

2. Please let us know if you have any general concerns that could be addressed in the EA. If you believe this proposal will significantly affect any tribal right(s) or protected resource(s), we invite you to consult with us on a government-to-government basis, in accordance with the U.S. Department of Defense *American Indian and Alaska Native Policy* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Please write to us and explain which tribal right(s) or protected tribal resource(s) will be affected and how they will be significantly affected. To initiate consultation, please contact Mr. Jon Scudder, Cultural Resources Program Manager, at (907) 384-6648 or jon.scudder@us.af.mil to determine a time which may be mutually convenient. Please provide your comments or requested information not later than 20 March 2017 in order to be considered during the preparation of the EA.

3. The USAF will publish a notice of availability (NOA) of the EA and draft Finding of No Significant Impact (FONSI) in the Anchorage Daily News and on the JBER website (http://www.jber.af.mil/environmental/index.asp). The NOA will initiate the public comment period and explain the method for submitting comments on the EA and draft FONSI.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.25@us.af.mil. An alternate point of contact is Mr. Brent Koenen, Chief of Natural Resources and Conservation, at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

GEORGE T.M. DIETRICH III
Colonel, USAF
Commander

Attachment:
Map of Proposed Alternative


W1
W2-1
W2-2
W3
W4
40
50
60
70
80
90
100
110
0 125 250 Meters
Approximate Area of Hill Removal
Alternative 2 Disposal Area
Delineated Wetland Boundary
Wetlands
10-foot Contours
Source: JBER 2016; ESRI World Imagery 2016. Developed in GCS_WGS_1984, presented in WGS_1984_UTM_Zone_6N. Map dated Aug 1, 2016. Imagery circa 2012.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.25@us.af.mil. An alternate point of contact is Mr. Brent Koenen, Chief of Natural Resources and Conservation, at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

MICHAEL E. SCHMIDT
Deputy Director

Enclosure:
Map of Proposed Alternative

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MEMORANDUM FOR: SEE DISTRIBUTION LIST

FROM: 673 CES/CD
6346 Arctic Warrior Drive
JBER AK 99506-3221

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE NORTH RUNWAY HILL REMOVAL PROJECT AT JOINT BASE ELMENDORF-RICHARDSON (JBER).

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an Environmental Assessment (EA) to analyze the potential impacts on the human environment from the extraction and disposal of soil north of Runway 16/34 at JBER. The proposed action is needed to bring flight operations at Elmendorf Airfield using Runway 16/34 into conformance with Unified Facilities Code (UFC) 3-260-01 and Federal Aviation Regulations (FAR) Part 77. Currently Runway 16/34 is in non-compliance due to a topographic feature (a hill) which obstructs the 50:1 glide slope requirement for Class B runways, posing a safety risk for departing and arriving aircraft. Current alternatives include reducing the existing hill and disposing the soil by filling in a lowland depression west of the runway (Enclosure), as well as the No Action Alternative. Under the No Action Alternative the Air Force would continue to be in non-compliance with UFC 3-260-01 and FAR Part 77.

2. The proposed action has the potential to affect wetlands on JBER. Consistent with the requirements and objectives of Executive Order 11990, *Protection of Wetlands*, this letter initiates early public notice of actions that have the potential to affect wetlands.

3. In an effort to analyze the potential effects of the proposed action, the USAF or the contractors preparing the EA may contact you in their data collection efforts. Please provide your comments or requested information not later than 16 September 2016 in order to be considered during the preparation of the EA.

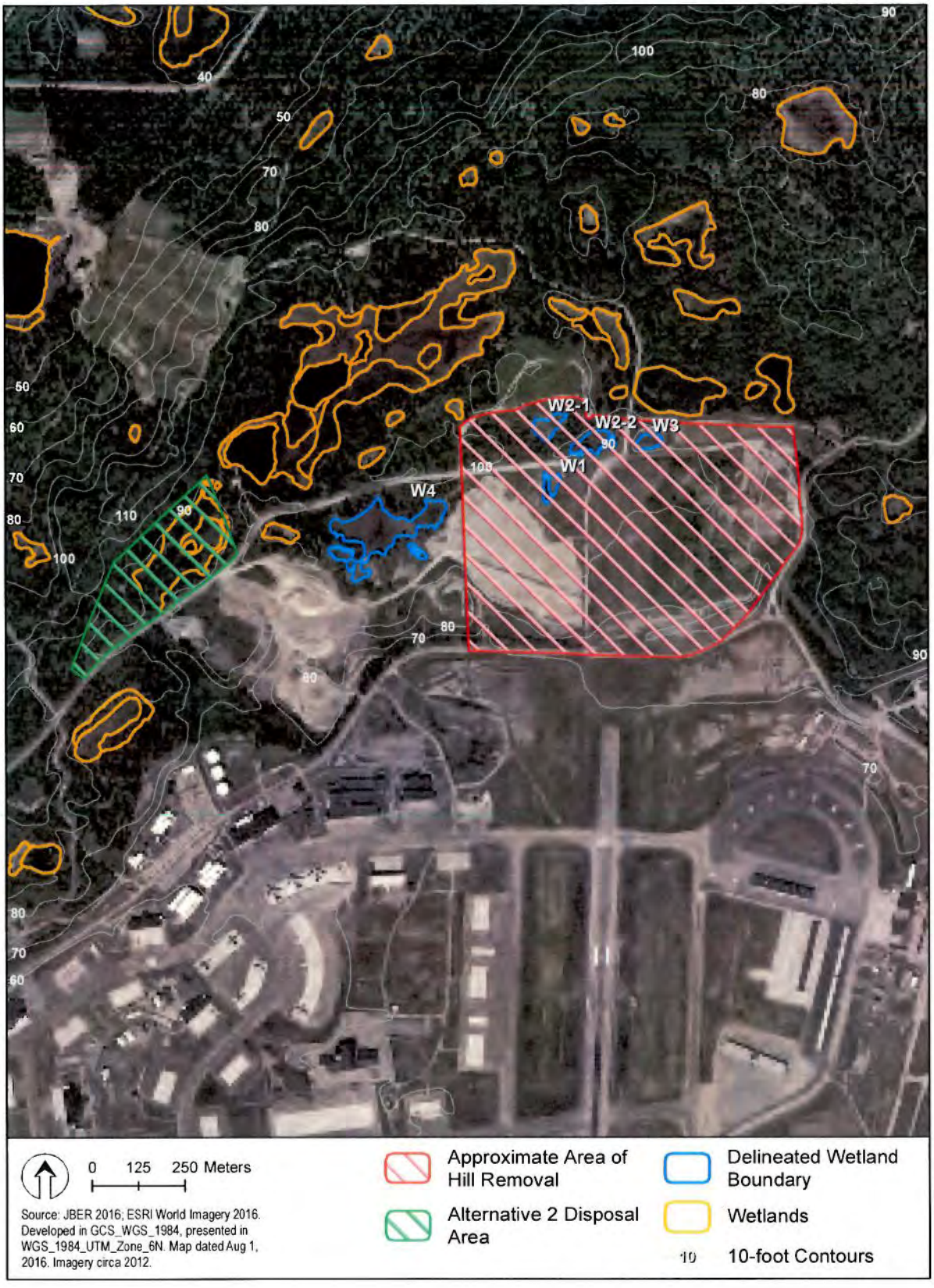
4. If you have any questions or comments on this request, please contact Mr. Zack Walker, Planner, at 673 CES/CENPP, 6346 Arctic Warrior Drive, JBER, AK 99506-3221; 907-384-2460, or zachary.walker.25@us.af.mil.

Sincerely,

MICHAEL E. SCHMIDT
Deputy Director

Enclosures:
Distribution List
Map of Proposed Soil Disposal Area

Organization	Division	Prefix	Name	Last Name	Street Address	City	State	Postal Code
Alaska Department of Environmental Conservation	Division of Air Quality	Ms.	Alice	Edwards	410 Willoughby Ave Ste 303	Juneau	AK	99801
Alaska Department of Environmental Conservation	Division of Environmental Health	Ms.	Kristin	Ryan	555 Cordova Street	Anchorage	AK	99501
Alaska Department of Environmental Conservation	Division of Water	Mr.	Bill	Griffith	555 Cordova Street	Anchorage	AK	99501
Alaska Department of Fish and Game	Division of Wildlife Conservation	Mr.	Mark	Burch	333 Raspberry Road	Anchorage	AK	99518
Alaska Department of Natural Resources	Division of Mining, Land, and Water	Mr.	Brent	Goodrum	550 W. 7th Ave Ste 1070	Anchorage	AK	99501
Alaska Department of Natural Resources	Office of the Commissioner	Mr.	Thomas	Irwin	550 W. 7th Ave Ste 1400	Anchorage	AK	99501
Alaska Department of Natural Resources	Division of Parks and Outdoor Rec	Attn	Claire	LeClair	550 W. 7th Ave Ste 1380	Anchorage	AK	99501
Alaska Department of Natural Resources	Division of Forestry	Mr.	Chris	Maisch	550 W. 7th Ave Ste 1450	Anchorage	AK	99501
Alaska Department of Natural Resources	Division of History & Archaeology	Ms.	Judith	Bittner	550 W. 7th Ave Ste 1310	Anchorage	AK	99501
National Marine Fisheries Service	Protected Resources Div	Mr.	Greg	Balough	222 W. 7th Ave, Box 43	Anchorage	AK	99513
U.S. Department of Interior	Office of Environmental Policy & Compliance	Ms.	Pamela	Bergmann	1689 C Street, Room 119	Anchorage	AK	99501
Bureau of Land Management	Anchorage Field Office	Mr.	Jim	Fincher	4700 BLM Road	Anchorage	AK	99507
U.S. Fish and Wildlife Service	Anchorage Fish & Wildlife Field Office	Ms.	Socheata	Lor	604 W. 4th Avenue, Room G-61	Anchorage	AK	99501
Municipality of Anchorage	Community Planning & Development	Mr.	Greg	Jones	4700 Elmore Road	Anchorage	AK	99507
Ted Stevens International Airport		Mr.	John	Parrott	3132 Channel Drive PO Box 112500	Juneau	AK	99811
Federal Aviation Administration		Mr.	Bob	Lewis	222 W. 7th Ave #14	Anchorage	AK	99513
Community Councils Center		Mr.	Mark	Butler	1057 West Fireweed Lane, Suite 100	Anchorage	AK	99503


W2-1
W2-2
W3
W1
W4
0 125 250 Meters
Approximate Area of Hill Removal
Alternative 2 Disposal Area
Delineated Wetland Boundary
Wetlands
10-foot Contours
Source: JBER 2016; ESRI World Imagery 2016. Developed in GCS_WGS_1984, presented in WGS_1984_UTM_Zone_6N. Map dated Aug 1, 2016. Imagery circa 2012.

From: Spegon, Jennifer [mailto:jennifer_j_spegon@fws.gov]
Sent: Friday, September 30, 2016 4:40 PM
To: WALKER, ZACHARY T GS-11 USAF PACAF 673 CES/CENPP <zachary.walker.25@us.af.mil>
Cc: Catherine Shaw <catherine_shaw@fws.gov>
Subject: Fwd: USFWS Comments JBER EA Fill Disposal N. Runway

Hello Zach, per my phone message earlier today, I'm sending the recommendations we discussed on our field visit August 17, 2016, for the fill disposal on JBER in Anchorage, Alaska. It sounds like you are already incorporating many of these conservation measures in your environmental analysis.

The U.S. Fish and Wildlife Service (Service) has reviewed the fill disposal on JBER and provides the following recommendations.

To reduce impacts to resident and migratory birds, we recommend avoiding clearing of previously-undisturbed ground cover or vegetation during the nesting season. Birds may be harassed and their nestlings could suffer from clearing vegetation during the nesting season. The Migratory Bird Treaty Act prohibits the willful killing or harassment of migratory birds. In order to avoid these impacts to migratory birds, the Service recommends vegetation removal be completed before the nesting season. For detailed information on when to avoid clearing for specific regions of Alaska, see the Service's attached Land Clearing Timing Guidance for Alaska.

To reduce impacts to bald eagles, we recommend a disturbance buffer of 660 feet and to avoid blasting and other activities that produce extremely loud noises within 0.5 mile of bald eagle nests (or within 1 mile in open areas), unless greater tolerance to the activity (or similar activity) has been demonstrated by the eagles in the nesting area. Bald and golden eagles and their nests are protected under the Bald and Golden Eagle Protection Act. While the Service can recommend methods to avoid take of eagles, accountability ultimately rests with the project proponent or responsible party to locate nests in proximity to proposed projects (https://www.fws.gov/alaska/eaglepermit/guidelines/disturbnestingbaea1.htm). If it is determined project related activities risk take of eagles, the Service recommends applying for a permit. The Service may issue permits for non-purposeful take of eagles, authorization is subject to avoidance and minimization of impacts, please refer to our website (http://www.fws.gov/alaska/eaglepermit/index.htm) for further information on eagle take permits in Alaska.

To expedite succession of functional habitat, we suggest salvaging and re-spreading topsoil over disturbed areas, where possible. The first 10-12 inches of soil contains site specific native seed and organic matter that will ultimately conserve resources and promote infill with native vegetation. In areas with existing native vegetation, we suggest salvaging the organic topsoil (by soil type) and spreading the topsoil (by soil type) back over the disturbed areas after construction. Topsoil should be stored separately from subsoil, signed as topsoil, and stored in a manner that will keep it viable until it is spread back over the disturbed site. If placement of materials such as riprap is implemented to stabilize stream banks above or below stream crossings, we suggest the use of topsoil to fill the voids between the stones and seed the surface with native grasses and/or forbs to provide some habitat value and help stabilize the rock. If placement of materials to stabilize stream banks (i.e., riprap) is implemented above or below stream crossings, topsoil fillings within the voids between the stones and the surface seeded with native grasses and/or forbs is recommended to provide some habitat value and help stabilize the rock.

We appreciate your consideration of our comments and recommendations and look forward to working with you in the future. If you have any questions, please contact Ms. Jennifer Spegon (907) 271-2768 or via electronic mail at jennifer_j_spegon@fws.gov <mailto:jennifer_j_spegon@fws.gov> .

Jennifer Spegon
Ecological Services
Anchorage Fish and Wildlife Field Office U.S. Fish and Wildlife Service
4700 BLM Rd
Anchorage, AK 99507
Phone: (907) 271-2768
FAX: (907) 271-2786
jennifer_j_spegon@fws.gov <mailto:jennifer_j_spegon@fws.gov>

Appendix C:
Public Notices and Responses

Public Notice
Agency: United States Air Force
Intent to Dispose Soil for Flight Safety at Joint Base Elmendorf-Richardson

The U.S. Air Force announces the intent to prepare an environmental assessment to extract and dispose soil from a hill currently obstructing the glide slope approaching the north/south runway at Elmendorf Airfield (Runway 16/34), at Joint Base Elmendorf-Richardson (JBER). Currently the north end of Runway 16/34 is in violation of Unified Facilities Criteria (UFC) 3-260-1 which addresses criteria for unobstructed airspace around military runways. The proposed action would involve the removal and disposal of approximately 2.0 million cubic yards of soil, which is necessary to conform with UFC 3-260-1 50:1 glide slope requirements. Current alternatives for soil disposal includes a site west of the runway where non-jurisdictional wetlands occur, as well as the No Action Alternative, in which no additional soil would be removed or disposed from the hill north of Runway 16/34. A map of the project area can be accessed on the JBER public webpage at http://www.jber.af.mil/Services-Resources/Environmental/NEPA.aspx, under the current NEPA Actions section. The proposed action is subject to requirements and objectives of Executive Order 11990 - "Protection of Wetlands," In accordance with this Executive Order, JBER and the Air Force invites the public to provide comments on the proposal and any practicable alternatives for soil extraction and disposal that may reduce or avoid impacts to wetlands. Comments should be sent to JBER Public Affairs, Building 10480 Sijan Ave. Suite 123, JBER, AK 99506, telephone 907-552-8151 or email: jber.pa.3@us.af.mil.

Photos by JOSH HANER / The New York Times

Mengkebuyin herds his sheep with a four-wheeler in the desert outside Kebonamuge, China, in mid-June. China's deserts have spread at an annual rate of more than 1,350 square miles, making rural life near impossible for the farmers, herders and villagers who live on the edge of the expanding Tengger Desert.

China's deserts expanding at accelerated rate

Josh Haner, Edward Wong, Derek Watkins and Jeremy White
The New York Times

IN THE TENGGER DESERT, China — The Tengger Desert lies on the southern edge of the massive Gobi Desert, not far from major cities like Beijing. The Tengger is growing.

For years, China's deserts spread at an annual rate of more than 1,350 square miles. Many villages have been lost. Climate change and human activities have accelerated the desertification. China says government efforts to relocate residents, plant trees and limit herding have slowed or reversed desert growth in some areas. But the usefulness of those policies is debated by scientists, and deserts are expanding in critical regions.

Nearly 20 percent of China is desert, and drought across northern China is getting worse. One recent estimate said China had 21,000 square miles more desert than what existed in 1975 — about the size of Croatia. As the Tengger expands, it is merging with two other deserts to form a vast sea of sand that could become uninhabitable.

Across northern China, generations of families have made a living herding animals on the edge of the desert. Officials say that along with climate change, overgrazing is contributing to the desert's growth. But some experiments suggest moderate grazing may actually mitigate the effects of climate change on grasslands, and China's herder relocation policies could be undermining that.

In an area called Alxa League, the government has relocated about 30,000 people, who are called "ecological migrants," because of desertification.

Officials have given Liu Jiali, 4, and her family a home in a village about 6 miles from Swan Lake, the oasis where they run a tourist park. To get them to move and sell off their herd of more than 70 sheep, 30 cows and eight camels, the officials have offered an annual subsidy equivalent to $1,500 for each of her parents and $1,200 for a grandmother who lives with them.

Jiali's mother, Du Jinping, 45, said the family would live in the new village in the winter, but return to Swan Lake in the summer.

Local governments in desert regions began relocating people away from the encroaching sands decades ago. But China's densely populated areas are pushing toward the deserts, as the deserts grow toward the cities.

Guo Kaimin stands among trees he planted to help hold back the sand in the Tengger Desert in China. Guo, a farmer, also manages a sand sculpture park on the edge of the expanding desert landscape.

Storms of wind-driven sand have become increasingly frequent and intense, reaching Beijing and other large cities. "We dread the sandstorms," Du said.

Residents who live on the edge of the deserts try to limit the steady march of the sand. Along with local governments, they plant trees in an effort to block the wind and stabilize the soil.

Many people in this area are from families that fled Minqin, at the western end of the Tengger Desert, during China's Great Famine from 1958-62, when tens of millions died.

Guo Kaiming, 40, a farmer who also manages a tourist park at the edge of the Tengger Desert, planted rows of trees by a new cross-desert highway in June.

Guo took saplings the government had left behind after it completed a tree planting operation. He said he was not ready to join the climate refugees. He has his corn and wheat fields, plus income from running the tourist park.

Last year, the company that runs the park paid students to build seven giant sand sculptures as its centerpiece. But strong desert winds steadily eroded them.

"They are all a mess now," Guo said. "The wind is fierce."

The government encourages farmers like Guo because, it says, agriculture can help reclaim land from the desert. Officials offer subsidies: Guo gets $600 per year for "grassland ecological protection."

But farming is also becoming more difficult. Huang Chunmei, who grew up in the town of Tonggunao'er and now farms there, said the water table was 2 meters, or about 6 feet, below ground during her childhood, and "now, you have to dig 4 or 5 meters."

Huang planted more than 200 trees on her own last spring, in the hope that they would help block sandstorms and hold back the sand.

"The soil is not as soft or good as it was before," she said. "We use more fertilizer now."

Huang and her husband have sent their 14-year-old daughter to a boarding school in a nearby city.

"I don't want my girl to return," she said. "The sand and wind make life tough here."

About 17 percent of the population in Alxa League are ethnic Mongolians, whose lives and livelihoods have long been tied to the herding the government is trying to halt.

Mengkebuyin, 42, and his wife, Mandula, 41, grow corn and sunflowers, but their 200 sheep provide most of their income: They sell the meat to a hotel restaurant in a nearby city.

The sheep graze in the desert, where grass is growing scarce. They roam near his old family home, near the shores of a lake that dried up years ago. He would like to move to better pasture, but the government will not let him. Mengkebuyin and his wife maintain the old home but do not stay for long periods. They have moved to a village 5 miles away.

Mengkebuyin and Mandula have decided that they want their 16-year-old daughter to live and work in a city.

Four generations of Mengkebuyin's family lived by the lake in a thriving community. But gradually, everyone left.

The desert has taken over.

Tourists pose with camels in the Tengger Desert in mid-June.

Iceland braces for Pirate Party takeover

Griff Witte
The Washington Post

REYKJAVIK, ICELAND — The party that could be on the cusp of winning Iceland's national elections on Saturday didn't exist four years ago.

Its members are a collection of anarchists, hackers, libertarians and web geeks. It sets policy through online polls — and thinks the government should do the same. It wants to make Iceland "a Switzerland of bits," free of digital snooping. It has offered Edward Snowden a new place to call home.

And then there's the name: In this land of Vikings, the Pirate Party may soon be king.

The rise of the Pirates — from radical fringe to focal point of Icelandic politics — has astonished even the party's founder, a poet, web programmer and former WikiLeaks activist.

"No way," said 49-year-old Birgitta Jónsdóttir when asked whether she could have envisioned her party governing the country so soon after its launch.

But this, after all, is 2016. And to a string of electoral impossibilities that suddenly became reality — including Britain voting for Brexit and Donald Trump winning the Republican nomination — the world may soon add a Pirate Party-led government in Europe.

Victory for the Pirates may not mean much in isolation. This exceptionally scenic, lava-strewn rock just beyond the Arctic Circle has a population less than half that of Washington, D.C., with no army and an economy rooted in tourism and fishing.

But a Pirate Party win would offer a vivid illustration of how far Europeans are willing to go in their rejection of the political mainstream, adding to a string of insurgent triumphs emanating from both the far left and far right.

To Jónsdóttir and other Pirate true believers — who define their party as neither left nor right, but a radical movement that combines the best of both — the election here could also be the start of the reboot that Western democracy so desperately needs.

"People want real changes and they understand that we have to change the systems, we have to modernize how we make laws," said Jónsdóttir, whose jet-black hair and matching nail polish cut a distinctive profile in a country where politics has long been dominated by paunchy blond men.

The sticker affixed to the back of her chrome-finish laptop stands out, too: an imitation seal of the U.S. government, the familiar arrow-bearing eagle encircled by the words "National Security Agency Monitored Device." At the Pirates' tech-start-up-esque office in an industrial area of Reykjavik's seafront, a Guy Fawkes mask hangs from the wall and a skull-and-crossbones flag peeks out from a ceramic vase.

Iceland is, in some ways, a strange place for such a rogue movement to flourish. The country is one of earth's most equitable, most peaceful and most prosperous. Home to the world's oldest parliament — it traces its origins back to a gathering of Norse settlers in A.D. 930 — this remote island nation that can feel more like a small, genteel town is not known for political turbulence.

But Iceland has been afflicted by the same anti-establishment fervor that has swept the rest of the Western world in recent years.

In many ways, the alienation from politics has been even more acute here. The 2008 global financial crisis brought the once highflying economy to ruin, saved only by a $4.6 billion international bailout. Bankers went to jail, and a street protest movement was born.

The populist spirit was revved up once again this past spring when the leak of the Panama Papers revealed an offshore company owned by the prime minister's wife that staked a claim to Iceland's collapsed banks. The perceived conflict of interest brought thousands of protesters to the streets, a crowd that, as a share of the overall population, was equal to as many as 21 million people in the United States.

With protests building, the prime minister quit and new elections were called. But the public's cynicism about a political system long steered by an insider clique only deepened.

"The distrust that had long been germinating has now exploded. The Pirates are riding on that wave," said Ragnheithur Kristjánsdóttir, a political history professor at the University of Iceland. "We've had new parties before, and then they've faded. What's surprising is that they're maintaining their momentum."

The Pirates, part of an international movement of the same name, are not the only ones seizing on the country's discontented political spirit. Several new parties have surged and could well set Iceland's direction for the next four years. Meanwhile, parties that have traded power in Iceland for decades are bumping along in polls at historic lows.

Outsiders may regard the idea of a government run by Pirates as a joke. But "the voters think a joke is better than what we have now," said Benedikt Jóhannesson, leader of another insurgent party that is even younger than the Pirates and has also earned substantial support.

Jóhannesson hastens to add that he doesn't see the Pirates as a joke. His buttoned-down party is made up of technocrats, academics and business executives, a far cry from the punk-rock, hacker spirit of the Pirates.

But the two may be in coalition talks after the election if, as expected, no party comes anywhere near the majority needed to govern. He may not agree with the Pirates on many issues, he said, but at least they share a belief in the need for fundamental change.

"Some of our parties have been around for 100 years," said Jóhannesson, fresh off a 10-hour drive back from a campaign swing through the remote Icelandic countryside. "But the systems that worked in, say, the 1960s don't necessarily work for the 2010s."

Public Notice

Agency: United States Air Force
Intent to Excavate and Dispose Soil for North Runway Hill Removal Project at Joint Base Elmendorf- Richardson

The U.S. Air Force announces the intent to prepare an environmental assessment to extract and dispose soil from a hill obstructing the glide slope approaching the north/south runway on Elmendorf Airfield (Runway 16/34), at Joint Base Elmendorf-Richardson (JBER). The obstructed approach to the north end of Runway 16/34 is a violation of Unified Facilities Criteria (UFC) 3-260-1 which addresses criteria for unobstructed airspace around military runways. The proposed action would involve the removal and disposal of approximately 2.0 million cubic yards of soil, which is necessary to conform with UFC 3-260-1 50:1 glide slope requirements. Alternatives for soil disposal include a site west of the runway where non-jurisdictional wetlands are located and the No Action Alternative, in which no additional soil would be removed or disposed from the hill north of Runway 16/34. A map of the project area can be accessed on the JBER public webpage at http://www.jber.af.mil/Services-Resources/Environmental/NEPA.aspx, under the NEPA Actions section. The proposed action is subject to requirements and objectives of Executive Order 11990 - Protection of Wetlands. In accordance with this Executive Order, JBER and the Air Force invite the public to provide comments on the proposal and any practicable alternatives for soil extraction and disposal that may reduce or avoid impacts to wetlands. Comments should be sent to JBER Public Affairs, Building 10480 Sijan Ave. Suite 123, JBER, AK 99506, telephone 907-552-8151 or email: jber.pa.3@us.af.mil.

2073 Horizon Court
Homer, Alaska 99603
25 October 2016

JBER Public Affairs
Building 10480 Sijan Ave. Suite 123
JBER, AK 99506

Ladies and Gentlemen:

In response to your notice to prepare an environmental assessment to flatten the glide slope for Runway 16, I enthusiastically support the project to increase airport safety when the east-west runway is out of service.

Cordially,

Dr. Douglas A. Stark,
LTC Civil Air Patrol

DEPARTMENT OF DEFENSE

NOTICE OF AVAILABILITY OF AN ENVIRONMENTAL ASSESSMENT FOR THE NORTH RUNWAY HILL REMOVAL PROJECT AT JOINT BASE ELMENDORF-RICHARDSON (JBER), ALASKA

AGENCY: U.S. Air Force (USAF), JBER, Alaska.

SUMMARY: The USAF is issuing this Notice of Availability (NOA) to advise the public that it has made available for public review and comment an *Environmental Assessment* (EA), *Draft Finding of No Significant Impact* (FONSI), and *Draft Finding of No Practicable Alternative* for the proposed action for the U.S. Air Force to remove and dispose soil north of Runway 16/34

A copy of the EA and Draft FONSI will be available for public review and comment for 30 days beginning on 2 March 2017 and ending on 1 April 2017. These documents will be available and online at http://www.jber.af.mil/Services-Resources/Environmental/NEPA.aspx (under "Current NEPA Actions").

Written comment shall be received and considered for incorporation into the EA until 1 April 2017, and should be directed to the JBER public affairs office. Written comments can be mailed to the public affairs office at the following address: 673 ABW/PA, 10480 Sijan Avenue, Suite 123, Joint Base Elmendorf-Richardson, Alaska 99506. Comments can also be emailed at jber.pa.3@us.af.mil. In the subject line please include the title of the Environmental Assessment.

Appendix D:
Preliminary Jurisdictional Determination Report and USACE Concurrence Letters

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, ALASKA 99506-0898
MAY 15 2015

Regulatory Division
POA-2014-531

673 CES/CEIEC
Attention: Mr. Brent Koenen
724 Postal Service Loop #4500
JBER, Alaska 99505-4500

Dear Mr. Koenen:

This is in response to your December 9, 2014, letter regarding a jurisdictional determination for parcels of land located within Section 27, T. 14 N., R. 3 W., Seward Meridian; USGS Quad Map Anchorage B-8; Latitude 61.2713° N., Longitude 149.7946° W.; on JBER, Alaska.

Based on our review of the information you provided and available to us, we have determined that the subject project will not involve placement of dredged and/or fill material into waters of the U.S. under our regulatory jurisdiction. The wetlands in the review area are isolated, intrastate, non-navigable, and have no connection to interstate or foreign commerce. Therefore, pursuant to the federal guidance on the Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, a DA permit is not required. A copy of the Approved Jurisdictional Determination form is available at: www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

This jurisdictional determination does not establish any precedent with respect to any other jurisdictional determination under Section 404 of the Clean Water Act.

Your proposed project was reviewed pursuant to Section 404 of the Clean Water Act which 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 wetlands, prior to conducting the work (33 U.S.C. 1344).

For regulatory purposes, the Corps of Engineers 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.

This approved jurisdictional determination is valid for a period of five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Also, enclosed is a Notification of Administrative Appeals Options and Process and Request for Appeal form regarding this approved jurisdictional determination (see section labeled "Approved Jurisdictional Determination").

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact Blake Romero via email at Blake.A.Romero@usace.army.mil, by mail at the address above, by phone at (907) 753-2735, or toll free from within Alaska at (800) 478-2712, if you have questions.

Sincerely,

Shannon Morgan

Shannon Morgan
Chief, South Branch

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: 673 CES/CEIEC	File Number: POA-2014-531	Date: May 4, 2015
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

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:

Blake Romero, Regulatory Specialist
Alaska District Corps of Engineers
CEPOA-RD-S
P.O. Box 6898
JBER, AK 99506-0898
(907) 753-2735

If you only have questions regarding the appeal process you may also contact:

Commander
USAED, Pacific Ocean Division
ATTN: CEPOD-PDC/Cindy Barger
Building 525
Fort Shafter, HI 96858-5440

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.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

Summary Sheet for isolated call based on SWANCC

Corps File Number and Waterway: POA-2014-531
Nearest Town/Village: JBER, Alaska
Proposed Conclusion:
The Corps does not have jurisdictional authority over 8.74 acres of wetlands north of Runway 34/16 on Joint Base Elmendorf-Richardson (JBER). The areas that were reviewed are demarcated in blue and labeled as W1, W2-1, W2-2, W3, and W4 in the attached map, sheet 3 of 7. This map was taken from the applicant's submitted wetland delineation, dated December 8, 2014, completed by Ms. Charlene Johnson, agent for the 673 CES/CEIEC.

Detailed Project Location Site:
The subject wetlands are located within Section 27, T. 14 N., R. 3 W., Seward Meridian, USGS Quad Map Anchorage B-8; at Latitude 61.2713º N., Longitude 149.7946º W.; on JBER, Alaska.

Vegetation:
Based on the wetland delineation datasheets submitted by the agent, the areas identified as exhibiting all three wetland indicators contain the following vegetation: Northern water-plantain (*Alisma trivale*) OBL, fowl blue grass (*Poa palustris*) FAC, leafy tussock sedge (*Carex aquatalis*) OBL, purple marshlocks (*Comarum palustre*) OBL, swollen beaked sedge (*Carex rostrata*) OBL, bluejoint (*Calamagrostis canadensis*) FAC, arctic blue grass (*Poa arctica*) FAC, tall scouring-rush (*Equisetum hyemale*) FACW, unknown sedge (*Carex spp*.), paper birch (*Betula papyrifera*) FACU, speckled alder (*Alnus incana*) FAC, diamond-leaf willow (*Salix pulchra*) FACW, white spruce (*Picea glauca*) FACU, slender wild rye (*Elymus trachycaulus*) FACU, and leatherleaf (*Chamaedaphne calyculata*) FACW.

Adjacent Vegetation:
Based on the wetland delineation datasheets submitted by the agent, the areas identified as lacking one or more of the three wetland indicators contain the following vegetation: Speckled alder (*Alnus incana*) FAC, broad-leaf fireweed (*Chamaenerion latifolium*) FAC, bluejoint (*Calamagrostis canadensis*) FAC, field horsetail (*Equisetum arvense*) FAC, common dandelion (*Taraxacum officnale*) FACU, paper birch (*Betula papyrifera*) FACU, white spruce (*Picea glauca*) FACU, diamond-leaf willow (*Salix pulchra*) FACW, narrow-leaf fireweed (*Chamaenerion angustifolium*) FACU, tall scouring-rush (*Equisetum hyemale*) FACW, prickly rose (*Rosa acicularis*) FACU, slender wild rye (*Elymus trachycaulus*) FACU, and red clover (*Trifolium pretense*) FACU.

Soils/Hydrology:
Based on the applicant's submitted delineation, the areas determined to have all three wetland indicators had the following soils present: 10YR 3/2 "MUCK/Mineral", 10YR 4/2 "sandy loam/gravel", 10YR 4/3 "gravelly/sandy loam", 10YR 3/1 "loamy muck", and 10YR 2/1 "muck, loamy sand".

The areas determined to be wetlands included the following primary wetland hydrology indicators: Surface water, high water table, saturation, water marks, sediment deposits, and drift deposits

The data points that were in areas determined to be wetlands also included the following secondary wetland hydrology indicators: drainage patterns, geomorphic position, and the FAC neutral test.

Soils type and Ksat water transfer calculations were determined by using information from the Natural Resources Conservation Service (NRCS) Web Soil Survey, based on two transects. Transect one begins at the wetland labeled "W4" and extends west to Triangle Lake. Transect two begins in the area of wetlands "W1", "W2-1", "W2-2", and "W3", and extends west to Fish Lake. The two transects consist of the following soil types:

415	Deception-Estelle-Kichatna complex, undulating and steep (Ksat – 0.57 inch/hour low, 1.98 inch/hour high)
446	Salamatof peat (Ksat – 5.95 inch/hour low, 19.98 inch/hour high)

The formula used to find out how long it would take water to transfer between the subject wetland is

- "(distance in feet x 12)/Ksat"

The results of all three calculations for both high and low were added up and the sum was divided by 24 to find the transfer time in days. This number was further divided by 365 to get the water transfer time in years. This calculation was completed for both transects.

Transect one:

415 inch/hour low – (792-feet x 12)/0.57=16,673.68

415 inch/hour high – (792-feet x 12)/1.98=4,800

Results of Ksat calculations for transect one:

Ksat inch/hour low – 16,673/24=694.71/365=1.90 years

Ksat inch/hour high – 4,800/24=200/365=0.55 year

Based on the information provided by the NRCS, the transfer time of water between the wetland labeled as W4 and Triangle Lake along transect one is, on average, approximately 1.22 years.

Transect two:

415 inch/hour low – (1406.5-feet x 12)/0.57=29,610.53

415 inch/hour high – (1406.5-feet x 12)/1.98=8,524.24

446 inch/hour low – (333.3-feet x 12)/5.95=672.20

446 inch/hour high – (333.3-feet x 12)/19.98=200.18

Results of Ksat calculations for transect two:

Ksat inch/hour low – (29,610.53+672.20)/24=1261.78/365=3.45 years

Ksat inch/hour high – (8,524.24+200.18)/24=363.52/365=0.99 year

Based on the information provided by the NRCS, the transfer time of water between the wetlands labeled as W1, W2-1, W2-2, and W3 and Fish Lake along transect two is, on average, approximately 2.22 years.

Adjacent Soils/Adjacent Hydrology:
Based on the applicant's submitted delineation, the areas determined to be lacking one or more wetland indicators had the following soils present: 10YR 3/3 "coarse, gravelly, disturbed", 10YR 3/4 "rocky, disturbed", 10YR 4/2 "coarse gravel till/loam", and 10YR 4/2 "coarse till sandy loam".

The data points that were in areas determined to be located in uplands did not contain any wetland hydrology indicators.

Investigation of Potential Hydrologic Connection:
The Corps' investigation consisted of trying to find a potential surface or shallow subsurface hydrologic connection between the subject wetlands and Fish and Triangle Lakes, both traditionally navigable waterways (TNWs). Both Fish Lake and Triangle Lake are located to the west, relative to the subject wetlands.

The investigation consisted of analysis of two transects because the wetlands labeled as W1, W2-1, W2-2, and W3 are clustered together in close proximity with one another, and W4 is located, at a minimum, approximately ¼-mile away from the cluster.

Based on the geography, topography, and proximity, it was determined that if there was a hydrological connection between the subject wetlands and a TNW, it would be with Fish and Triangle Lakes. After a review of all available data (the applicant's submitted delineation, Corps of Engineers ORM mapping, Fish and Wildlife Service (FWS) online National Wetland Inventory (NWI) mapper, NRCS Web Soil Survey, and Google Earth aerial imagery), it was determined that in addition to there being an upland separation between the subject wetlands and the closest TNWs, there is no potential shallow subsurface connection between the subject wetlands and Knik Arm. As stated above in the soils section, Ksat measurements suggest that the minimum water transfer times are approximately 1.22 and 2.22 years.

Summary:
All available data, including the applicant's December 8, 2014, wetland delineation, appears to suggest that the subject wetlands are geographically, ecologically, and hydrologically isolated from all TNWs and RPWs. The use, degradation, or destruction of the subject wetlands would not affect interstate commerce, and they are not used by interstate of foreign travelers for recreation of other purposes. There are no fish or shellfish present that could be taken and sold in interstate or foreign commerce. The subject wetland is not and could not be used for industrial purposes that would result in interstate commerce.

Prior to the 2001 Supreme Court decision in Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, the wetland areas would have been considered jurisdictional based solely on the "Migratory Bird Rule". Currently, these waters must be considered non-jurisdictional.

Blake Romero
Regulatory Specialist
District Office
Regulatory Division
U.S. Army Corps of Engineers
907-753-2735

Attachments:

Sheet 1 of 7, dated March 4, 2015 – Alaska location area map
Sheet 2 of 7, dated March 4, 2015 – Anchorage location area map
Sheet 3 of 7, dated March 4, 2015 – Delineation area map
Sheet 4 of 7, dated March 4, 2015 – USACE ORM, topography map
Sheet 5 of 7, dated March 4, 2015 – FWS NWI online mapper, wetland map
Sheet 6 of 7, dated March 4, 2015 – NRCS Web Soil Survey, soils map
Sheet 7 of 7, dated March 4, 2015 – NRCS Web Soil Survey, Ksat summary by map unit

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): February 9, 2015

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Alaska District, POA-2014-531 – 673 CES/CEIEC

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Alaska City: Joint Base Elmendorf-Richardson
Center coordinates of site (lat/long in degree decimal format): Lat. 61.2713 ° N, Long. 149.7946 °W
Name of nearest waterbody: Fish Lake
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Cook Inlet
Name of watershed or Hydrologic Unit Code (HUC): 19020401

☑ 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: March 4, 2015

☐ Field Determination. Date(s): *Click here to enter a date., Click here to enter a date.*

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.

☐ 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: *Click here to enter text.*

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):**

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☐ Relatively permanent waters (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

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: # linear feet: # width (ft) and/or # acres.
   Wetlands: # acres.

   c. **Limits (boundaries) of jurisdiction** based on: *Choose an item.*

   Elevation of established OHWM (if known): *Click here to enter text.*

2. **Non-regulated waters/wetlands (check if applicable):**

☑ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The subject wetland was determined to be an isolated water of the U.S.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

1. TNW

Identify TNW: *Click here to enter text.*

Summarize rationale supporting determination: *Click here to enter text.*

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": *Click here to enter text.*

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: # *Choose an item.*
Drainage area: # *Choose an item.*

Average annual rainfall: # inches
Average annual snowfall: # inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☐ Tributary flows through *Choose an item.* tributaries before entering TNW.

Project waters are *Choose an item.* river miles from TNW.
Project waters are *Choose an item.* river miles from RPW.
Project waters are *Choose an item.* aerial (straight) miles from TNW.
Project waters are *Choose an item.* aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: *Click here to enter text.*

Identify flow route to TNW: *Click here to enter text.*
Tributary stream order, if known: *Click here to enter text.*

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain: *Click here to enter text.*

☐ Manipulated (man-altered). Explain: *Click here to enter text.*

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: *Click here to enter text.*
☐ Other. Explain: *Click here to enter text.*

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: *Click here to enter text.*
Presence of run/riffle/pool complexes. Explain: *Click here to enter text.*
Tributary geometry: *Choose an item.*
Tributary gradient (approximate average slope): #%

(c) Flow:

Tributary provides for: *Choose an item.*
Estimate average number of flow events in review area/year: *Choose an item.*
Describe flow regime: *Click here to enter text.*
Other information on duration and volume: *Click here to enter text.*

Surface flow is: *Choose an item.* Characteristics: *Click here to enter text.*

Subsurface flow: *Choose an item.* Explain findings: *Click here to enter text.*
☐ Dye (or other) test performed: *Click here to enter text.*

Tributary has (check all that apply):
☐ Bed and banks

- ☐ OHWM (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list): *Click here to enter text.*
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community *Click here to enter text.*
- ☐ Discontinuous OHWM. Explain: *Click here to enter text.*

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list): *Click here to enter text.*
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: *Click here to enter text.*

Identify specific pollutants, if known: *Click here to enter text.*

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): *Click here to enter text.*
- ☐ Wetland fringe. Characteristics: *Click here to enter text.*
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: *Click here to enter text.*
  - ☐ Fish/spawn areas. Explain findings: *Click here to enter text.*
  - ☐ Other environmentally-sensitive species. Explain findings: *Click here to enter text.*
  - ☐ Aquatic/wildlife diversity. Explain findings: *Click here to enter text.*

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: *Click here to enter text.*

Wetland quality. Explain: *Click here to enter text.*

Project wetlands cross or serve as state boundaries. Explain: *Click here to enter text.*

(b) General Flow Relationship with Non-TNW:

Flow is: *Choose an item.* Explain: *Click here to enter text.*

Surface flow is: *Choose an item.*

Characteristics: *Click here to enter text.*

Subsurface flow: *Choose an item.* Explain findings: *Click here to enter text.*

- ☐ Dye (or other) test performed: *Click here to enter text.*

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: *Click here to enter text.*
  - ☐ Ecological connection. Explain: *Click here to enter text.*
  - ☐ Separated by berm/barrier. Explain: *Click here to enter text.*

(d) Proximity (Relationship) to TNW

Project wetlands are *Choose an item.* river miles from TNW.

Project waters are *Choose an item.* aerial (straight) miles from TNW.

Flow is from: *Choose an item.*

Estimate approximate location of wetland as within the *Choose an item.* 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: *Click here to enter text.*

Identify specific pollutants, if known: *Click here to enter text.*

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): *Click here to enter text.*
- ☐ Vegetation type/percent cover. Explain: *Click here to enter text.*
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: *Click here to enter text.*
  - ☐ Fish/spawn areas. Explain findings: *Click here to enter text.*
  - ☐ Other environmentally-sensitive species. Explain findings: *Click here to enter text.*
  - ☐ Aquatic/wildlife diversity. Explain findings: *Click here to enter text.*

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: *Choose an item.*

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: *Click here to enter text.*

C. SIGNIFICANT NEXUS DETERMINATION

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: *Click here to enter text.*

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: *Click here to enter text.*

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: *Click here to enter text.*

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: # linear feet # width (ft), Or, # acres.
   - ☐ Wetlands adjacent to TNWs: # acres.

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: *Click here to enter text..*
   - ☐ 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: *Click here to enter text..*

   Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters:

3. **Non-RPWs 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):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters: *Click here to enter text.*

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: *Click here to enter text.*

☐ 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: *Click here to enter text.*

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 jurisidictional. 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.**
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):

☐ 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: *Click here to enter text.*

☐ Other factors. Explain: *Click here to enter text.*

Identify water body and summarize rationale supporting determination: *Click here to enter text.*

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters: *Click here to enter text.*

☐ 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: *Click here to enter*

text.

☐ Other: (explain, if not covered above): *Click here to enter text.*

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): # linear feet # width (ft).

☐ Lakes/ponds: # acres.

☐ Other non-wetland waters: # acres. List type of aquatic resource: *Click here to enter text..*

☑ Wetlands: 1.72 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): # linear feet # width (ft).

☐ Lakes/ponds: # acres.

☐ Other non-wetland waters: # acres. List type of aquatic resource: *Click here to enter text..*

☐ 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: Submitted request, dated December 9, 2014

☑ 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: *Click here to enter text.*

☐ Corps navigable waters' study: *Click here to enter text.*

☐ U.S. Geological Survey Hydrologic Atlas: *Click here to enter text.*

☐ 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: Anchorage B-8

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS Web Soil Survey

☐ National wetlands inventory map(s). Cite name: *Click here to enter text.*

☐ State/Local wetland inventory map(s): *Click here to enter text.*

☐ FEMA/FIRM maps: *Click here to enter text.*

☐ 100-year Floodplain Elevation is: *Click here to enter text.* (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date): *Click here to enter text.*

☐ or ☑ Other (Name & Date): Applicant provided delineation, dated December 8, 2014

☐ Previous determination(s). File no. and date of response letter: *Click here to enter text.*

☐ Applicable/supporting case law: *Click here to enter text.*

☐ Applicable/supporting scientific literature: *Click here to enter text.*

☐ Other information (please specify): *Click here to enter text.*

B. ADDITIONAL COMMENTS TO SUPPORT JD: *Click here to enter text.*

Blake Romero
Regulatory Specialist

March 4, 2015
Date

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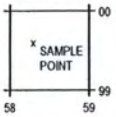
GN
MN

MAGNETIC DECLINATION
17.9°

G-M ANGLE
20.3° (360 MILS)

GRID CONVERGENCE
2° 22' (42 MILS)
FOR CENTER OF SHEET

SAMPLE 1,000 METER GRID SQUARE



100,000 M. SQUARE IDENTIFICATION

UP
UN **00

GRID ZONE DESIGNATION

6V

1:10,131

0 50 100 200 300 400 Meters

ELLIPSOID . . . . . WORLD GEODETIC SYSTEM 1984
GRID . . . . . 1000 METER UTM ZONE 6
PROJECTION . . . . . TRANSVERSE MERCATOR
VERTICAL DATUM . . . . . MEAN SEA LEVEL
HORIZONTAL DATUM . . . . WORLD GEODETIC SYSTEM 1984

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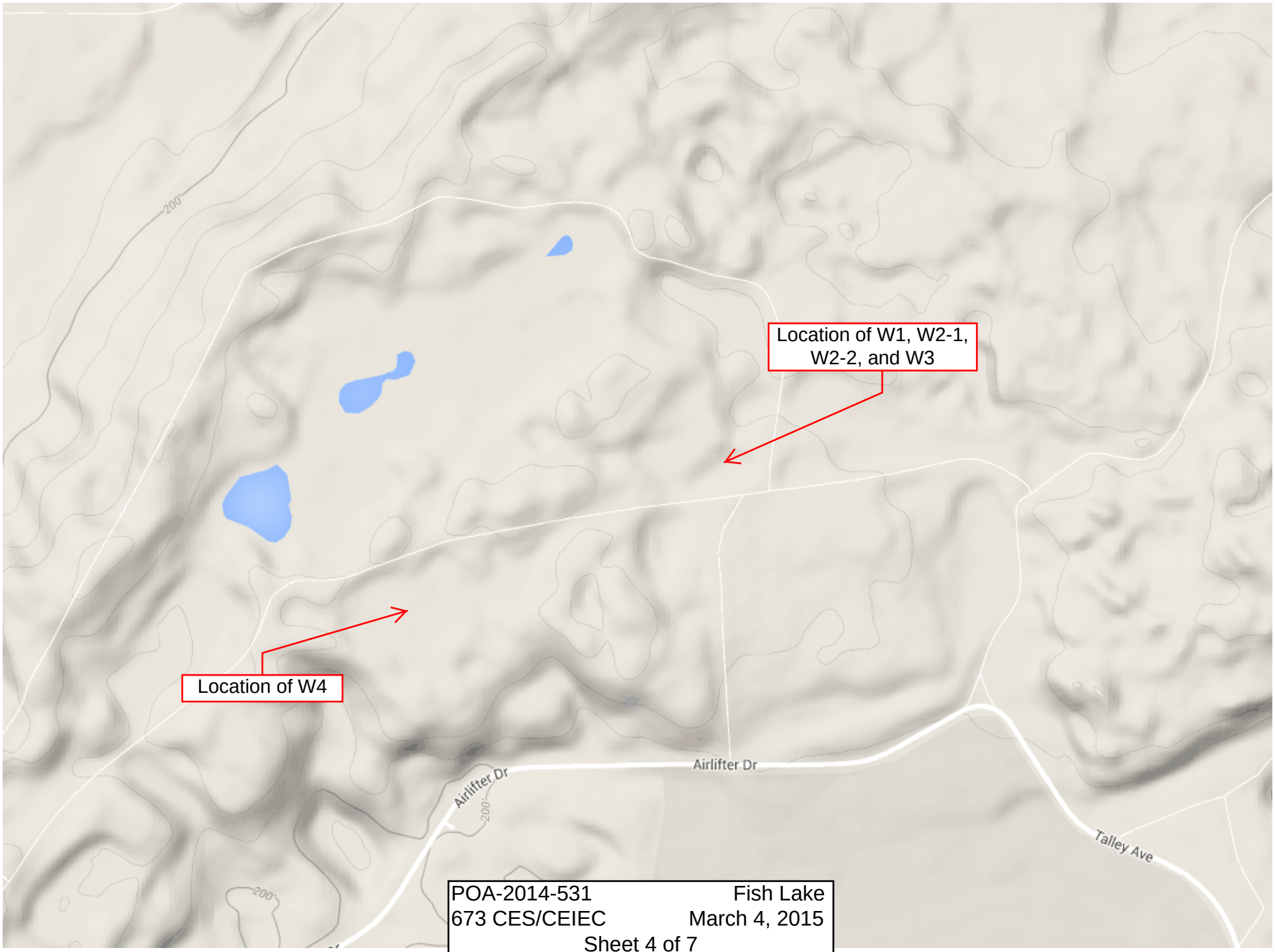

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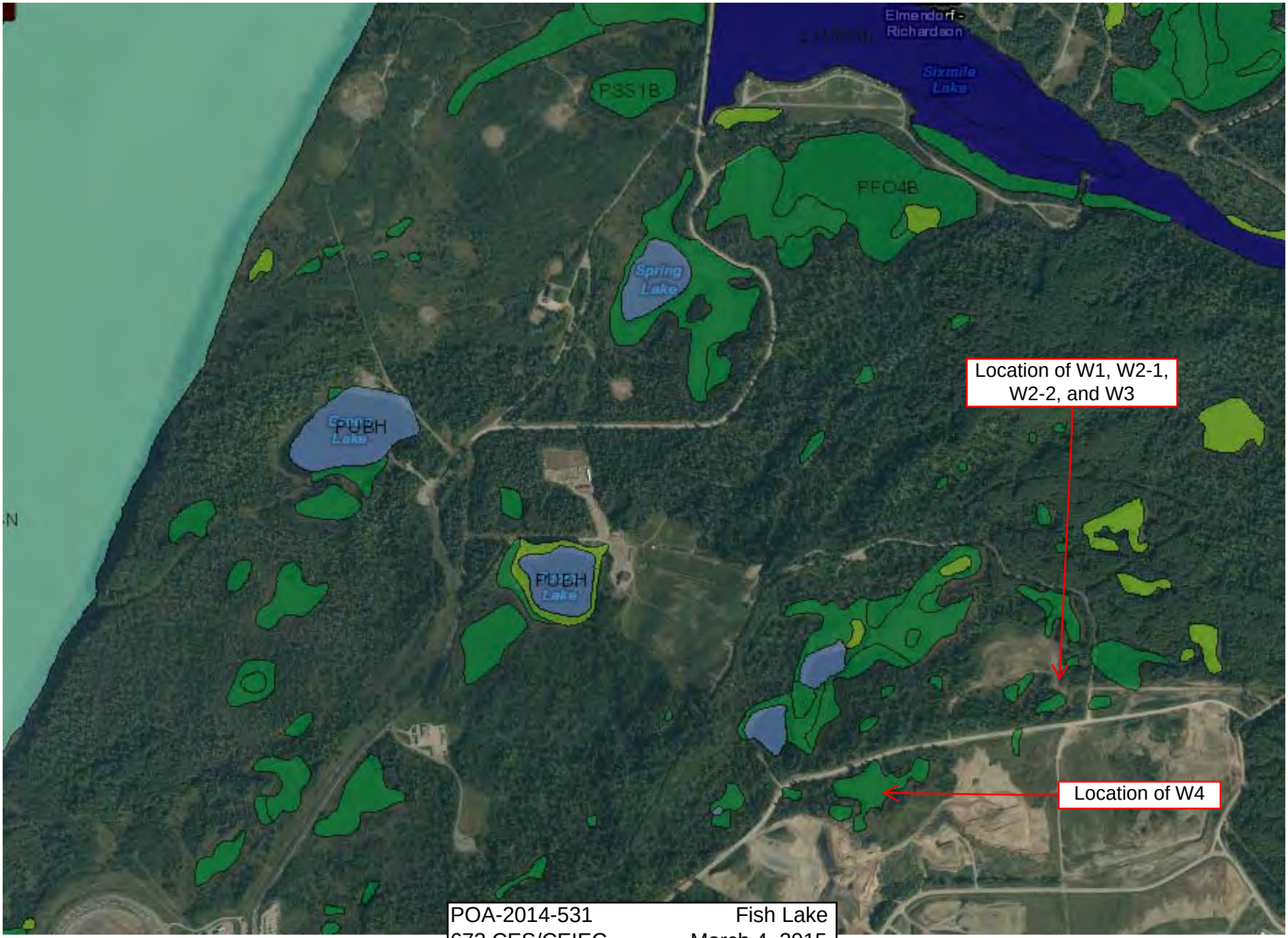

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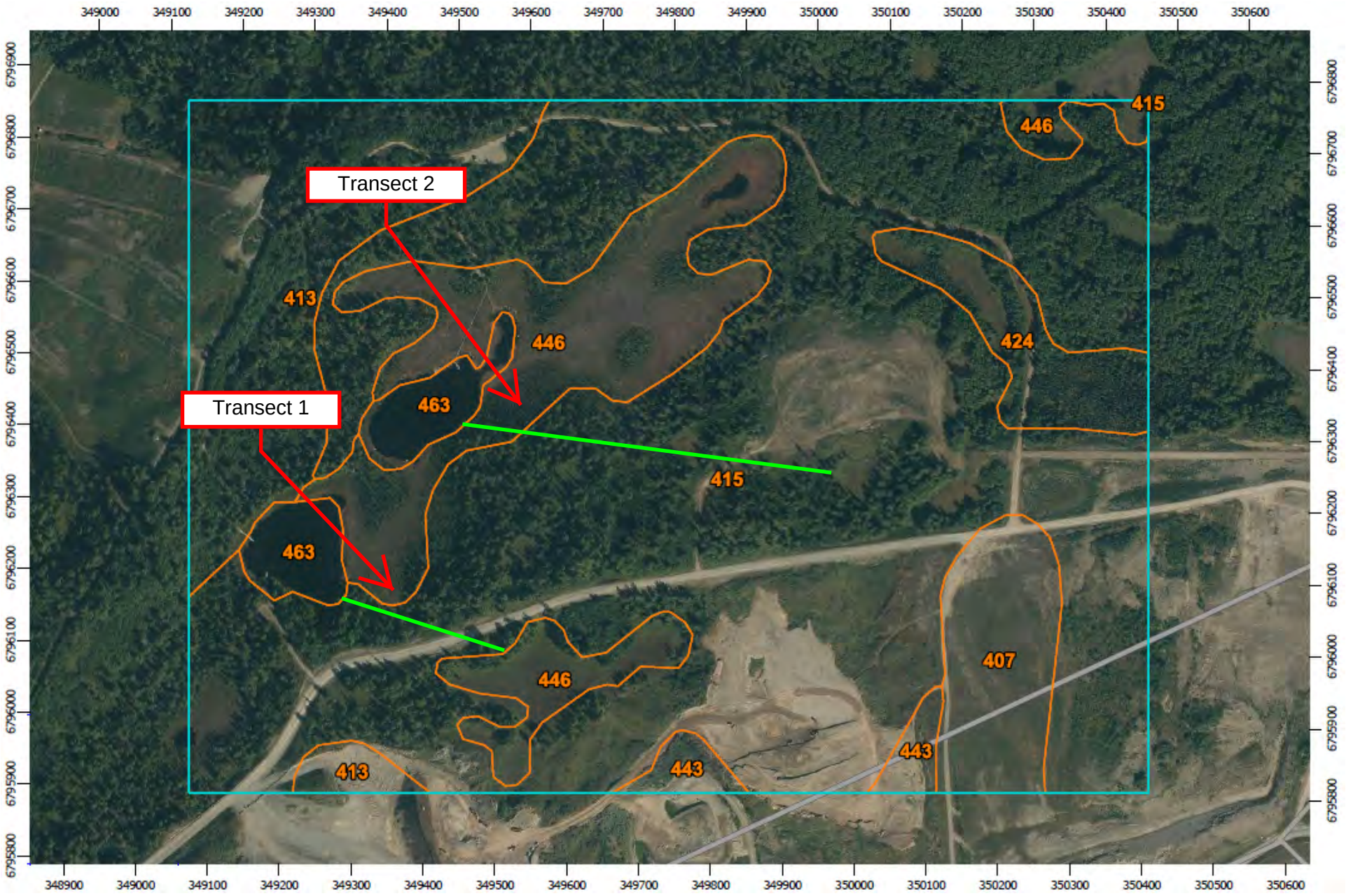

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Saturated Hydraulic Conductivity (Ksat)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Anchorage Area, Alaska (AK605)				
Map unit symbol	**Map unit name**	**Rating (micrometers per second)**	**Acres in AOI**	**Percent of AOI**
407	Cryorthents and Urban land, 5 to 20 percent slopes	7.7600	13.5	6.3%
413	Deception-Estelle-Kichatna complex, 45 to 85 percent slopes	10.6928	12.4	5.8%
415	Deception-Estelle-Kichatna complex, undulating and steep	10.6928	137.1	63.9%
424	Icknuun peat, 0 to 3 percent slopes	28.0000	6.7	3.1%
443	Pits, gravel		3.2	1.5%
446	Salamatof peat, 0 to 3 percent slopes	90.0000	32.7	15.2%
463	Water, fresh		8.9	4.1%
Totals for Area of Interest			**214.5**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Fastest

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

Regulatory Division
POA-2015-556

673 CES/CEIEC
Attention: Ms. Charlene Johnson
724-Postal Service Loop, #4500
JBER, Alaska 99505-4500

Dear Ms. Johnson:

This is in response to your October 6, 2015, letter regarding a jurisdictional determination for a parcel of land located within Section 28, T. 14 N., R. 3 W., Seward Meridian; USGS Quad Map AK-ANCHORAGE B-8; Latitude 61.2686° N., Longitude 149.8158° W.; Municipality of Anchorage, on JBER, Alaska.

Based on our review of the information you provided and available to us, we have determined that the subject parcel will not involve placement of dredged and/or fill material into waters of the U.S. under our regulatory jurisdiction. The wetlands in your project are isolated, intrastate, non-navigable, and have no connection to interstate or foreign commerce. Therefore, pursuant to the federal guidance on the Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, a Department of the Army permit is not required. A copy of the Approved Jurisdictional Determination form is available at:
www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

This jurisdictional determination does not establish any precedent with respect to any other jurisdictional determination under Section 404 of the Clean Water Act.

For regulatory purposes, the Corps of Engineers 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.

This approved jurisdictional determination is valid for a period of five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Also, enclosed is a Notification of Administrative Appeals Options and Process and Request for Appeal form regarding this approved jurisdictional determination (see section labeled "Approved Jurisdictional Determination").

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact Ms. Danielle Shack via email at Danielle.g.shack@usace.army.mil, by mail at the address above, by phone at (907) 753-2728, or toll free from within Alaska at (800) 478-2712, if you have questions.

Sincerely,

Shane McCoy
Chief, South Section

Enclosures

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): November 17, 2015

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Alaska District, POA-2015-556

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Alaska Borough: JBER City: Anchorage
Center coordinates of site (lat/long in degree decimal format): Lat. 61.2686 °, Long. 149.8158 °W
Name of nearest waterbody: Triangle Lake
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A
Name of watershed or Hydrologic Unit Code (HUC): 190204010808

☑ 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: November 20, 2014

SECTION II: SUMMARY OF FINDINGS

A. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "*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):

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters (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

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: linear feet: width (ft) and/or 8.57 acres.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on:

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):

☑ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain: The subject wetland was determined to be an isolated water of the U.S.

C. 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: *Click here to enter text.*

☐ Other: (explain, if not covered above): *Click here to enter text.*

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): . linear feet . width (ft).

☐ Lakes/ponds: ..

☐ Other non-wetland waters: = acres. List type of aquatic resource: *Click here to enter text.*.

☑ Wetlands: 8.575 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): = linear feet = width (ft).

☐ Lakes/ponds: = acres.

☐ Other non-wetland waters: = acres. List type of aquatic resource: *Click here to enter text.*.

☐ 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: submitted request, dated October 6, 2015

☑ 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: *Click here to enter text.*

☐ Corps navigable waters' study: *Click here to enter text.*

☐ U.S. Geological Survey Hydrologic Atlas: *Click here to enter text.*

☐ 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: AnchorageB-8

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS Web Soil Survey

☑ National wetlands inventory map(s). Cite name: National Wetlands Inventory Map (NWI)

☐ State/Local wetland inventory map(s): *Click here to enter text.*

☐ FEMA/FIRM maps: *Click here to enter text.*

☐ 100-year Floodplain Elevation is: *Click here to enter text.* (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date): *Click here to enter text.*

☐ or ☑ Other (Name & Date): Applicant provided delineation, dated October 6, 2015

☐ Previous determination(s). File no. and date of response letter: *Click here to enter text.*

☐ Applicable/supporting case law: *Click here to enter text.*

☐ Applicable/supporting scientific literature: *Click here to enter text.*

☐ Other information (please specify): *Click here to enter text.*

B. ADDITIONAL COMMENTS TO SUPPORT JD: *Click here to enter text.*

Danielle Shack

Danielle Shack
Regulatory Specialist

December 1, 2015
Date

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: 673 CES/CEIEC	File Number: POA-2015-556	Date: 1March16
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
x	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

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:
Danielle G. Shack, RS Alaska District Corps of Engineers CEPOA-RD-S P.O. Box 6898 JBER, AK 99506-0898 (907) 753-2728	Regulatory Program Manager U.S. Army Corps of Engineers, Pacific Ocean Division CEPOD-PDC, Bldg 525 Fort Shafter, HI 96858-5440

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.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

2 Oct 2015

MEMORANDUM FOR U.S. ARMY CORPS OF ENGINEERS
ATTENTION: MR. SHANE MCCOY

FROM: 673 CES/CEIEC
724 Postal Service Loop #4500
JBER AK 99505-4500

SUBJECT: Request for Jurisdictional Determination of Wetlands at the north end of Runway 34/16, Joint Base Elmendorf-Richardson (JBER), Alaska

1. United States Air Force (USAF) respectfully requests a jurisdictional determination to be made by the U.S. Army Corps of Engineers (USACE) regarding wetlands located in proximity to an USAF project area located on Joint Base Elmendorf-Richardson (JBER), Alaska. The enclosed report details field conditions gathered in September 2015 by Professional Wetland Scientist (P.W.S.) Charlene C. Johnson, JBER Ecologist.

2. The USAF is currently developing a project to remove hazardous trees and landforms, including hills and ponded areas, which may impede safe air field operations. A disposal location for excavated material at the north end of Runway 34/16 is needed to help meet clearance objectives for safe flight operations. The nearest location with adequate capacity to hold the excavated material includes a wetland and pond just northwest of the excavation area.

3. It is the intent of the USAF to avoid and minimize impacts to federally jurisdictional wetlands to the maximum extent practicable. Planning and project development tasks and financial considerations are dependent on the jurisdictional nature of these wetlands and waters, pursuant to Section 404 of the Clean Water Act. Project implementation is planned for May 2016. An expeditious determination whether these resources are subject to regulatory authorization is necessary to minimize project implementation impacts. Please provide us an expected jurisdictional determination completion schedule when it becomes known.

5. If you have any questions, please contact Charlene C. Johnson, P.W.S. at 907-552-0310 or Charlene.johnson@colostate.edu

BRENT A. KOENEN, GS-13, DAF
Chief, Environmental Conservation

Attachment:
Preliminary Jurisdictional Determination Report

cc
2nd Lt Patrick Compton

ELMENDORF FLIGHT LINE SAFETY PROJECT
JOINT BASE ELMENDORF-RICHARDSON
JBER-Elmendorf, Alaska

Preliminary Jurisdictional Determination Report

October 2, 2015

Charlene C. Johnson
P.W.S. #1868
JBER Wetland Ecologist
673rd CES/CEIEC
Joint Base Elmendorf-Richardson
6346 Arctic Warrior Drive
JBER, Alaska 99506-3221
907-552-0310
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Appendix A ..... USACE Data Forms and Site Photographs
Appendix B ..... Wetland Jurisdictional Determination POA-2014-513

ACRONYMS AND ABBREVIATIONS

DNR	Alaska Department of Natural Resources
CFR	Code of Federal Regulation
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information System
GPS	Global Positioning System
JBER	Joint Base Elmendorf-Richardson
JDR	Jurisdictional Determination Report
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
PWS	Professional Wetland Scientists
RODM	Routine Onsite Data Method
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Survey
USGS	U.S. Geological Survey
WOUS	Water of the U.S.

INTRODUCTION AND PURPOSE

This portion of the Elmendorf Flight line Safety Project (project) is located between Dena'ina Road and Airlifter Road, north of the North/South runway located at U.S. Air Force Base Elmendorf on Joint Base Elmendorf-Richardson (JBER), Alaska. The project area is shown in the figures appended to this report. The USAF has been actively implementing a project to remove hazardous trees and landforms, including hills and ponded areas, which may impede safe air field operations. Terminal Instrument Procedures requires a runway to have a minimum clear guide slope of 40:1, with optimum slope of 50:1. Excavation and relocation of earth at the north end of Runway 34/16 is needed to meet these clear guide slope requirements. Wetlands and ponded areas were identified in 2014 prior to implementation of the excavation project. These areas were determined to be non-jurisdictional by the U.S. Army Corps of Engineers (Corps) in case number POA-2014-531 (attached). In the course of implementing the excavation project, additional disposal space was needed to accommodate approximately 1.5 million cubic yards of clean fill material which would be generated from excavation of the hill area at the north end of the flightline. The project study area includes all areas within the Cherry Hill Borrow Pit Survey Area.

The project is located in Township 14 North, Range 3 West, Section 27, Seward Meridian, JBER, Alaska. Approximate coordinates for the center of the hazard area are latitude 61° 16' 3.38" North and longitude -149° 49' 2.646" West NAD83.

The purpose of this preliminary jurisdictional determination report (PJDR) is to present information to support the Corps' determination of the jurisdictional status under authority of Section 404 of the Clean Water Act for a wetland area which is under consideration as a disposal location for the material to be excavated for the flight line safety project. By federal law and associated regulatory guidance, wetland and water impacts must be avoided to the maximum extent practicable. Unavoidable impacts must be minimized and compensatory mitigation may be required in accordance with the Federal Mitigation Rule (April 2008). This document does not include a detailed project description at this time, as the resulting jurisdictional determination may or may not determine the practicability of this alternative. If authorization from the Corps of Engineers is required to incur impacts to project area wetlands, then a full project description will be included with an Application for Department of the Army Permit (ENG Form 4345).

Wetlands, waters of the U.S., and uplands (non-wetlands), as referenced in this report, are defined as:

> *Wetlands:* "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" (33 CFR Part 328.3[b]). Wetlands are a subset of "waters of the U.S." Note that the "wetlands" definition does not include unvegetated areas such as streams and ponds.
>
> As described in the 1987 USACE *Wetlands Delineation Manual* and in the 2007 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Alaska Region* (USACE 2007), wetlands must possess the following three characteristics: 1) a vegetation community dominated by plant species that are typically adapted for life in saturated soils, 2) inundation or saturation of the soil during the growing season, and 3) soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.
>
> *Waters of the U.S.:* Waters of the U.S. include other waterbodies regulated by the USACE, including navigable waters, lakes, ponds, and streams, in addition to wetlands.
>
> *Uplands:* Nonwater and nonwetland areas are called uplands.

In addition to a site meeting wetland criterion, it may also be classified as either a jurisdictional or non-jurisdictional wetland depending on its connectivity to waters of the U.S. or their tributaries, as described above. Court decisions released in 2008 have attempted to clarify USACE regulatory authority over

wetlands without a direct surface water connection or significant nexus to other regulated waters. Jurisdiction of wetlands and waters shall be defined herein, in accordance with the proposed revised definition of 'Waters of the United States' (WOUS), under the Clean Water Act (40 CFR 230.3, April 21, 2014). This shall include those wetlands with a "significant nexus" to clearly identified WOUS, including those waters, including wetlands, either alone or in combination with other similarly situated waters in the region (i.e., the watershed that drains to the nearest water identified under the approved definition), significantly affects the chemical, biological, or physical integrity of a WOUS. Similarly situated is interpreted as when wetlands perform similar functions and are located sufficiently close together so that they can be evaluated as a single landscape unit with regard to their effect on the chemical, physical, or biological integrity of connected WOUS.

Within the jurisdictional determination process flow characteristics, functions, and connectivity of the tributary itself, together with the functions performed by any wetlands adjacent to that tributary, will be assessed to determine whether collectively they have a significant nexus with traditional navigable waters (EPA and USACE 2008). Wetlands without a significant nexus to a TNW would be classified as nonjurisdictional.

METHODS

The wetland delineation methodology consisted of four main components, described below: a review of existing data, preliminary wetland mapping, field verification, and finalization of wetland boundaries.

Review of Existing Data

The following information was reviewed to aid in determining the presence of wetlands in the study area:

- Topography: 2012 LIDAR
- Aerial imagery: 2009 (summer), 2012 (late fall) Aerial imagery
- National Resource Conservation Service (NRCS) Soil Survey Mapping (Web Soil Survey October 2014), Anchorage Area Soil Survey (Soil Conservation Service, 1979)
- Land Cover Classification (JBER, est. 2003)
- 2014 Installation Wetland Inventory (JBER, 2014)

Preliminary Wetland Mapping

JBER Wetland Ecologist and Professional Wetland Scientist (P.W.S.) reviewed aerial photographs, soil survey mapping, and existing wetland inventory mapping to determine the presence of wetlands or other waters of the U.S. in the study area. Current soil survey mapping, hydrography, and existing wetland inventory mapping is shown in the figures appended to this report. Wetland, upland, and wetland type boundaries were digitized into a geographic information system (GIS) database. Delineating wetlands from aerial photography includes looking for vegetation clues, evidence of soil saturation, and evaluating topographic features. On aerial photography, scientists look for saturation-adapted vegetation communities, low plant height, open canopy structure, and the presence of hydrophytic plant species. Visible evidence of wetland hydrology was also sought, including surface water and darker areas of photos indicating surface saturation. A site's proximity to streams, open water habitat, and marshes can indicate shallow subsurface water. Topographic depressions, toes of slopes, and flat topography can serve as indicators of potentially poor soil drainage. Lastly, evidence of topographic high points and sloped surfaces that would allow soils to drain can be used to support classifying areas as upland. These observations were corroborated with field observations to determine designation of the wetland boundary. GIS polygons were then attributed with NWI mapping codes and classifications based on the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) and *The Alaska Vegetation Classification* (Viereck et al. 1992). Preliminary wetland boundaries defined in the *U.S. Air Force Installation Wetlands Mapping and Field Verification Report* (MWH 2013) and updated annually by JBER Natural Resources were used for the initial project area assessment.

Field verification

Field reconnaissance occurred on September 25th 2015. Site investigations were performed by Charlene Johnson, JBER Wetland Ecologist (PWS #1868). In the field, characteristic wetland and upland areas were studied using the three parameter method of determining an area's wetland status outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Alaska Region* (USACE 2007) and the 1987 *Corps of Engineers Wetlands Delineation Manual* (USACE 1987). Standard USACE data forms were completed at sampling points and photographs were taken to document the vegetation and field conditions. Observation points were taken at representative areas where wetland/upland status was obvious (i.e. ponds and inundated areas). Observation points consist of ground verification of the three wetland parameters, field notes, and photographs. Representative observation points were selected in each major ecotype represented in the wetland basin. Each location was recorded with a Trimble Geo 7X GPS. The completed data forms and photographs are included in Appendix A.

Final Mapping

Upon returning from the field, data points were converted to shape files and transferred to ArcMap GIS. Aerial photographs from 2009 and 2012, 2012 LIDAR data, historic and current soil surveys, and other available GIS resources were used to refine and finalize wetland boundaries and adjust attributes to represent existing on-the-ground conditions. The delineated wetland boundary and test pit locations are included in a figure appended to this report.

SUMMARY OF WETLAND INDICATORS

The vegetation, hydrology and soil conditions described below are based on late season field work conducted by JBER Wetland Ecologist and P.W.S. on September 25th, 2014. Table 1 summarizes indicators observed at each of these plot locations.

Table 1. Summary of Project Area Wetland

Plot ID	Hydrophytic Vegetation	Hydric Soil	Wetland Hydrology	NWI Code
W1-U1				UPLAND
W1-W2	X	X	X	PEM2C
W2-U3				UPLAND
W2-W4	X	X	X	PEM2C
W3-U5				UPLAND
W3-W6	X	X	X	PSS1E
W3-U7				UPLAND
W3-W8	X	X	X	PSS1B/C, PEM1B/C
W3-W9	X	X	X	PAB4H0
W3-W10	X	X	X	PSS1/ FO4Bg

Three wetlands were sampled and observations documented using standard USACE data forms. Wetland 1 was measured to be 0.050 acres. Wetland 2 was measured to be 0.025 acres. Wetland 3 was measured to be 8.500 acres. Wetlands 1 and 2 were small depressions bordered on all sides by a steep slope (approximately 25%-30% grade). These depressions lacked any clear inlet or outlet. Wetland 3 was a large (8.5 acre) complex with a mixed forested/shrub carr edge, stunted spruce forested/ericaceous shrub carr established on a floating mat, with an open water pond inclusion.

The delineation was conducted on the outer edge of the wetlands, but sample plots were also established in each of the wetland and water inclusions, to document wetland types within the assessment area.

The primary factor in delineating the wetland boundary was the steep topography that occurred from the slope bordering the basins on all sides. A marked change in organic content in the soil, herbaceous vegetation composition, and saturation occurred as the edge of the wetland intersected with the steep slope. Boundaries were parked with pink flagging labeled "Wetland Boundary", typically near the intersection of the wetland basin with the slope.

Vegetation

A list of dominant vascular plant species observed in the study area during the field investigation and their respective wetland indicator status is provided on each RODM data sheet. Despite late season vegetative senescence, dominant vegetation was identified with reasonable confidence using vegetative and reproductive features present on site and corroborated with the local vegetative survey (Lipkin and Tande, 2001). Dominant species were identified using the"50/20 Rule" from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Alaska Region* (USACE 2007). Due to the late season sampling, non-dominant herbs were typically not identified as remaining vegetative parts lacked enough information to support positive identification. Due to the nature and general composition of the vegetation in wetland areas under investigation, there was no question with regard to the dominance by herbaceous hydrophytes in areas suspect to be wetland. All trees and shrubs were clearly identifiable.

Canada bluejoint reed grass (*Calamagrostis canadensis*), Alaskan paper birch (*Betula neoalaskana var papyrifera*), and alder (*Alnus incana*) were FAC neutral species dominant in both wetlands and uplands. The presence/absence of dominant species such as prickly rose (*Rosa acicularis*) and fireweed (*Chamaenerion angustifolium*) in uplands and iris (*Iris setosa*), ostrich fern (*Matteuccia struthiopteris),* and/or marshlocks (*Comarum palustre*) in wetlands were helpful indicators in the smaller depressions and along the edge of the larger basin, but vegetation alone was not a reliable indicator for delineating the boundary location.

Soils

The *Anchorage Area Soil Survey* (1979) indicates the presence of two soil types, described in the table below. The NRCS Web Soil Survey (WSS), however, mapped soils slightly differently. Salmatof peat soils were indicated in the 1979 survey at locations directly related to the peat bog wetland areas within the project boundaries. Only Wetland 3 is mapped as having hydric peat soils (Sa) in the historic survey, but not in the current WSS. Non-hydric soils mapped as Homestead (Hs) in the 1979 survey and Deception-Estelle-Kitchatna in the current NRCS survey. Both are described as non-hydric, well drained soils, occurring on hilly slopes and comprised of very gravelly, sandy, loam with mixed glacial till.

The soil mapping between the 1979 Anchorage Soil Survey and the current Web Soil Survey (NRCS) generally shows the wetness of the area and correlates with soil characteristics observed in the field. The 1979 soil survey indicated mapped peat soil units (Salmatof peat) in locations correlated to the ponded and floating mat/bog inclusion. A soil map is included in the figures appended to this report. The current soil survey does not distinguish the peat soils in the wetland basin delineated in this assessment, but does identify the open water feature. The historic (1979) soil survey most accurately describes the peat bog; while both resources accurately describe the current conditions of the smaller depressions (Wetlands 1 and 2), the wetland basin edges of Wetland 3, and hilly matrix around all wetland areas. A lidar map of 1-meter contours is included in the figures appended to this report.

Wetlands 1 and 2 were small depressions that are likely, at most, seasonally saturated. These soils showed faint to modestly prominent oxidized root channels and reduced features (mottles) below the organic surface soil horizon. No hydric soil indicators were observed in the slope-side plots determined to be upland. Soil features in the larger basin of Wetland 3 were in stark contrast to the soils of the adjacent steeply sloped hillside. Wetland 3 soils within the wetland boundary were supersaturated, richly-blackened, organic soils; with some loamy texture mixed into lower horizons, over coarse rock till. Upland soils were well drained and had well defined horizons. While assessing the location of the wetland

boundary around the edge of the Wetland 3 basin, soils were frequently sampled using and Eijkelkamp soil probe to monitor changes in the soil composition where vegetation cues were less reliable.

Table 2. Elmendorf Area Soil Series Units Located in Study Area

Soil Classification	Soil Class Features
Salmatof Peat (Sa)/(446) (from Anchorage Survey- 1979)	• Level/depressional • Poorly drained • Forms on silty sediments in low bottomlands • Dark peaty (6-20 in.) over greyish-brown mucky silt loam • Permeability moderate • Water capacity high • Hydric
Deception-Estelle-Kichatna (413) (named in current survey; formerly identified as Homestead silt loams- (HsDD, HsE in Anchorage Survey-1979)	• Hilly with short choppy slopes (20-45%) • Well drained • Forms over coarse, silty loess over gravel till/outwash • Greyish to dark brown loam (depending on slope) • Typically 5-10 in. of loess over very gravelly moraine. • Moderate permeability • Water capacity is low

Hydrology

Monthly precipitation data for the three-month period prior to the field investigation and the month of September was reviewed. The normal (30 yr) cumulative precipitation for January through September is 12.28 inches. The current cumulative precipitation (2015) is 10.20 inches, about two inches below normal (to date). In the current year, the monthly precipitation for June was 0.93 inches (normal = 0.97); July was 2.53 inches (normal = 1.83); and August was 0.97 inches (normal = 3.25). Precipitation for September, through the 25th was 2.8" (normal = 2.99; less than 0.2 of an inch below normal with five days left in the month). The previous winter held a very low snowload; run off from which is the primary source of water recharge in the kettle moraine depressions, such as these. However, despite what seemed to be a dry growing season; the precipitation in 2015 was overall near normal. Low saturation in the depressions of Wetlands 1 and 2 may be reflective of a low snowload over the previous winter (minimal water surcharge) and low precipitation in August, the month prior to conducting the delineation.

Hydrology indicators observed at each plot are shown in Table 6.

Table 3: Hydrology Indicators Found in the Study Area

Site ID	Primary Hydrology Indicators						Secondary Hydrology Indicators		
	Surface Water	High Water Table	Sat. in Upper 12"	Inundation Visible	Water stained leaves	Drainage Patterns	Oxidized Rhizospheres	Stunted or stressed plants	Geomorph Position
W1-W2					X	X	X		X
W2-W4			X		X	X	X		X
W3-W6			X		X	X	X		X
W3-W8			X		X	X	X		X
W3-W9	X		X	X					X
W3-W10	X	X	X					X	X

WETLAND AND WATERBODY CLASSES OBSERVED IN PROJECT SITE

Wetlands were identified where indicators of hydrophytic vegetation, wetland hydrology, and hydric soils were observed. Connectivity of wetlands within the study area was assessed using GIS as well as in the field. All wetlands in the study area are depressional in a landscape with highly variable topography, primarily in the form of rolling hills, but also including roadways. This combination of land form extends over 4,000 acres of the otherwise minimally developed Elmendorf Moraine between the JBER-Elmendorf and Six-mile Lake. Two traditionally navigable ponds- Triangle and Fish Lakes- exist east of the wetland assessment area.

Triangle Lake is a 3.98 acre rainbow trout pond located approximately more than 200 feet east of Wetland 1. Fish Lake is a 5.12 acre rainbow trout pond located just east of Triangle Lake. Both Triangle and Fish Lakes are connected to each other by a wetland between the two lake systems. Geomorphically, at least a portion of the wetland connecting the lakes is a floating mat system, indicating a significant hydrologic connection between the two lakes. However, since both Wetlands 1 and 2 are separated from Triangle Lake by steep and undulating moraine and have no defined inlet or outlet, they do not appear to be directly hydrologically connected to Triangle or Fish Lake. The drainageway described in the northeast corner of Wetland 3 receives runoff from surround upland slopes, but peaks at a topographical elevation before sloping back down toward Triangle Lake, cutting off a surface flow connection between the lake and the larger wetland basin. All other ingress and egress to Wetland 3 are restricted by naturally occurring steep slopes, including a portion of the slope modified by the roadbed in the southwest corner of the basin. There are no culverts or drainages out of the basin supporting connectivity to any other traditionally navigable waters.

PRELIMINARY JURISDICTIONAL STATUS

All wetlands and waterbodies lie in depressions without an apparent surface water connection to either of the nearby traditionally navigable waters or the Cook Inlet tidal waters (approximately 1.25 miles west). Subsurface soil properties include coarse, gravelly, moraine, which may effectively constitute a subsurface, hydrological connection between the wetlands in the study area and neighboring Triangle and Fish Lakes.

CONCLUSION

The U.S. Air Force hereby requests that a Jurisdictional Determination be made on whether or not a significant nexus exists between traditional and/or federally navigable waters and the project area wetlands and thus whether or not the wetlands within the study area are regulated under the authority of the Corps of Engineers. Once the jurisdiction of the wetlands in the study area is confirmed, final project planning will commence and a permit application, if necessary, shall be forthcoming.

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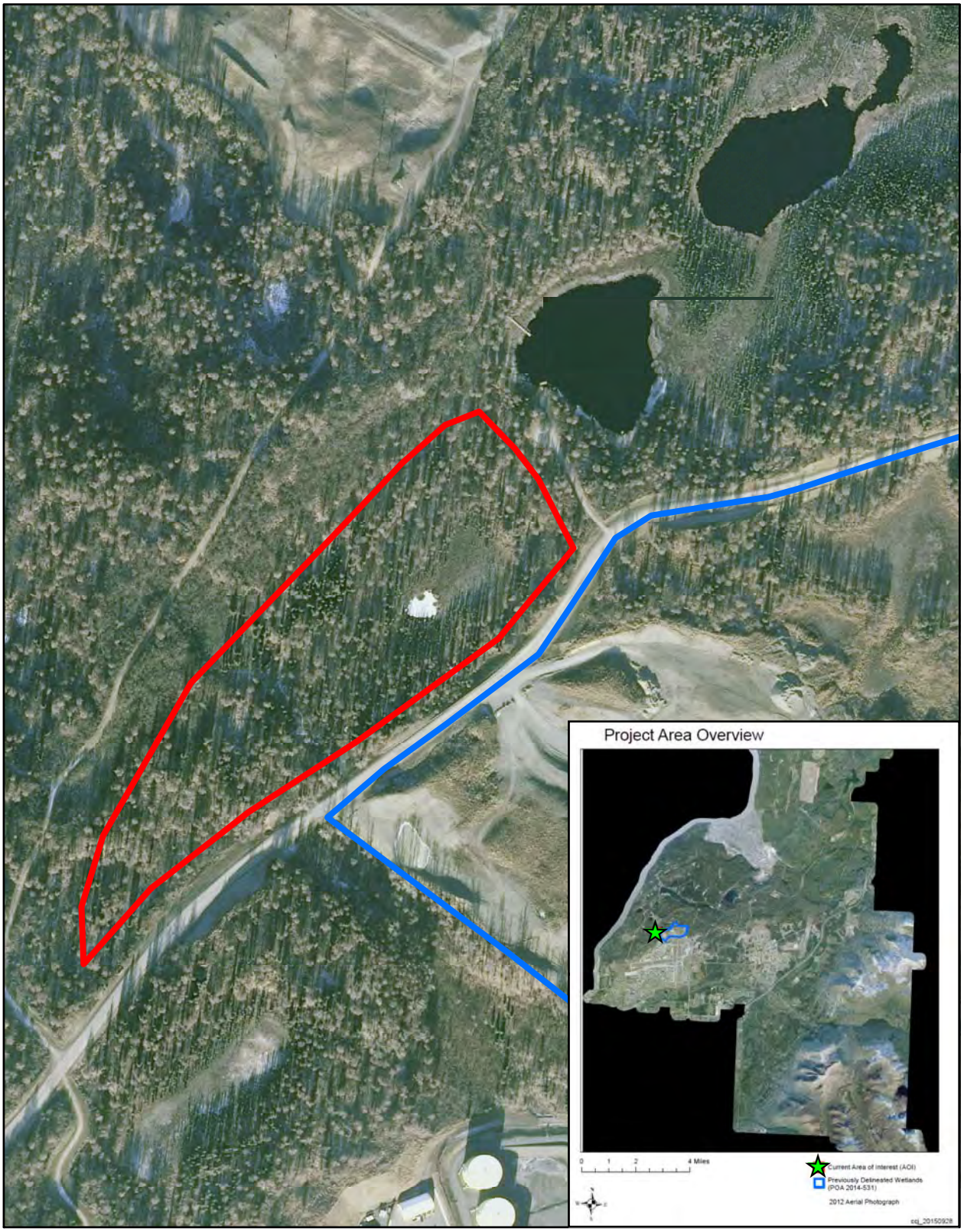
FIGURES

Project Area Overview



0 0.05 0.1 0.2 Miles

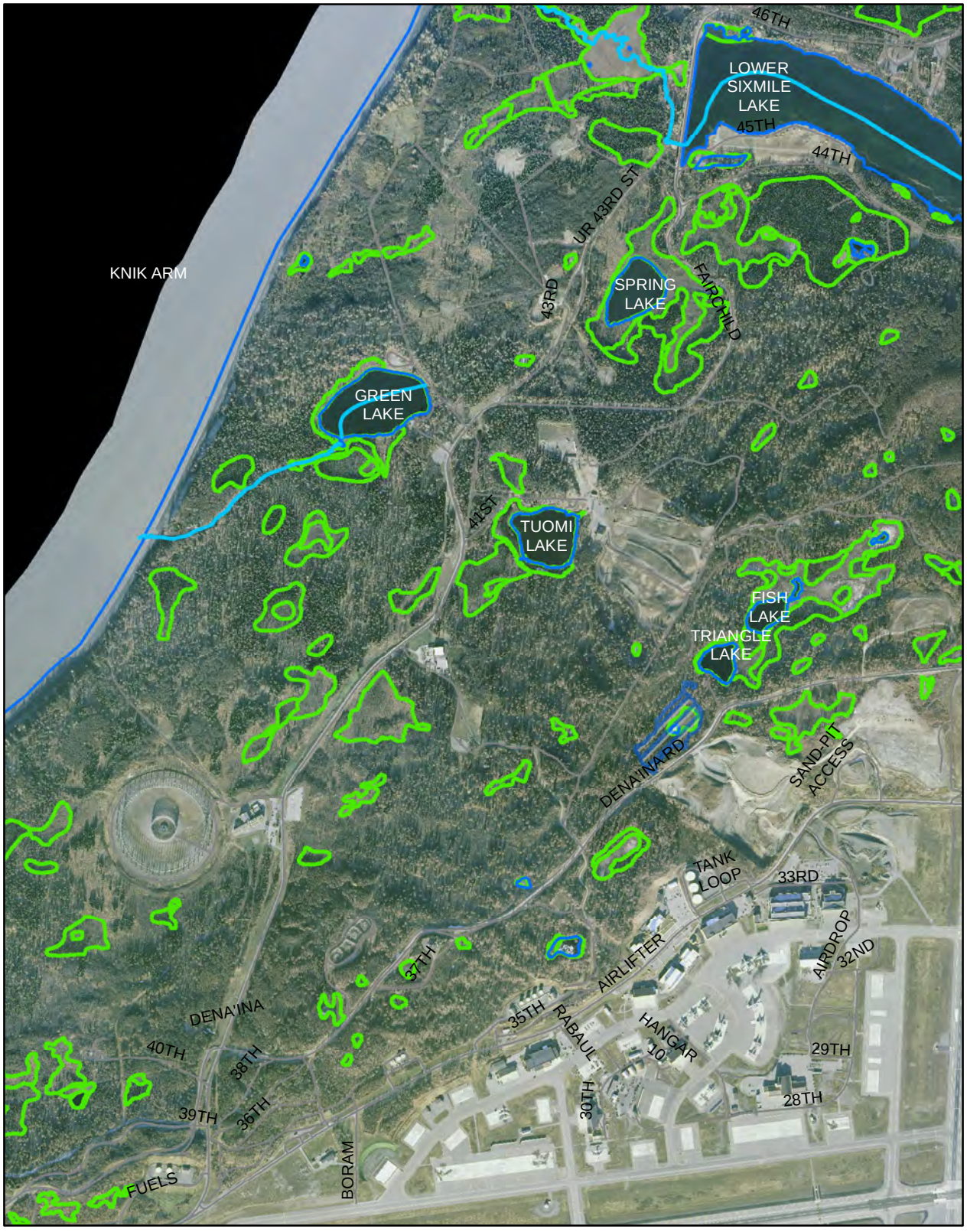
Current Area of Interest (AOI)

Previously Delineated Wetlands (POA 2014-531)

2012 Aerial Photograph

ccj_20150928

Hydrography Map



0 0.2 0.4 0.8 Miles

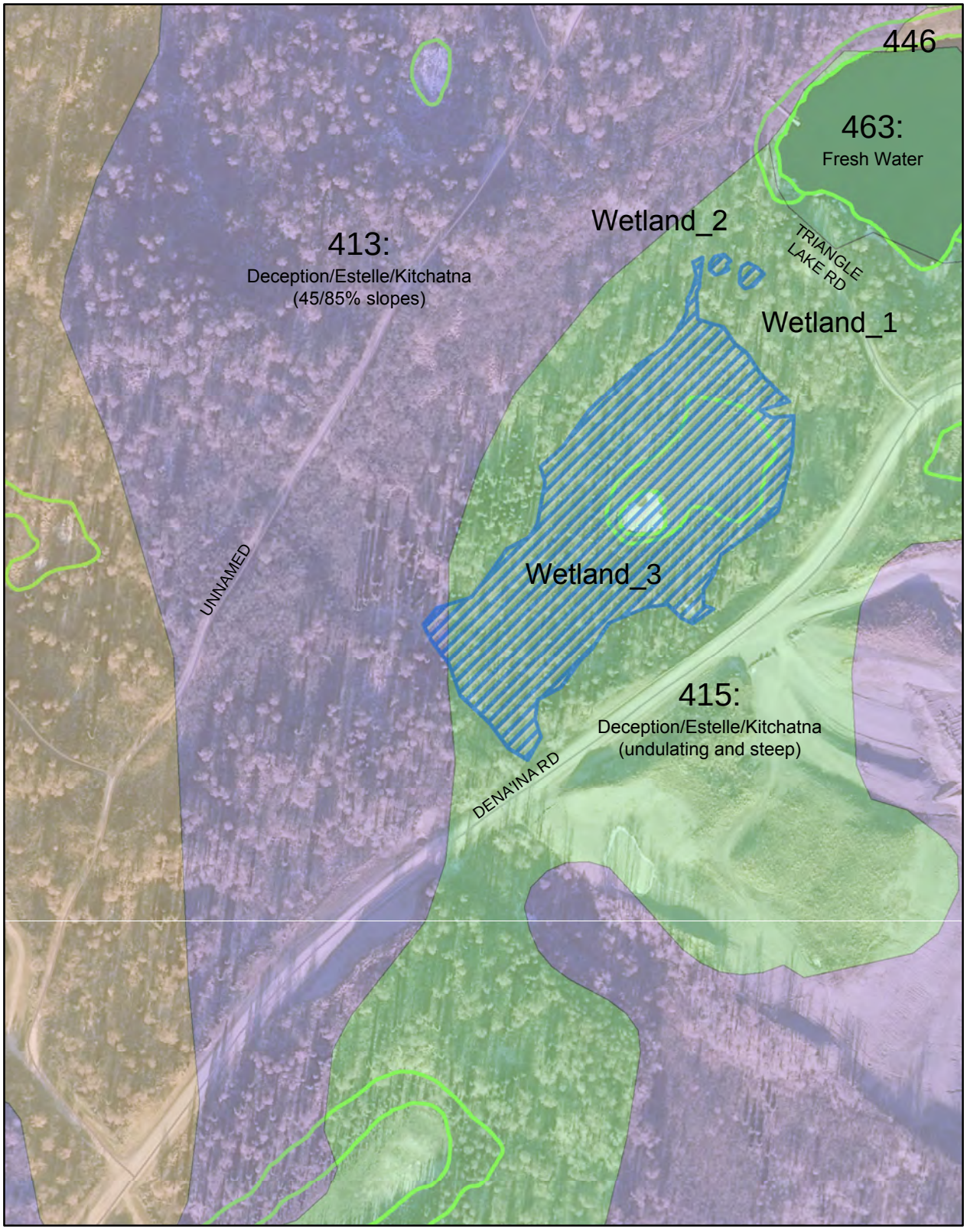
Legend

- Delineated Wetland Boundary
- JBER Wetland Inventory
- FXSB.NaturalWaterbody
- FXSB.WatercourseLine

Wetlands indicated by the green line on this map have been identified through an assessment of available electronic and mapping resources including but not limited to aerial photographs, topographic data, hydrography data, vegetative data, soil inventory, and other historic archives which indicated the likelihood of conditions suitable for the presence of wetlands. Wetlands depicted in blue hashmarking shown on this map have been delineated by a qualified wetland delineator, but have not been the subject of any field verification by the Corps of Engineers.
This map is to be used only as a planning tool and not for regulatory purposes until the Corps of Engineers has conducted a review to determine if wetlands in this area are subject to regulatory control. If there are any ground disturbing activities planned for this area, a pre-jurisdictional determination should be requested from the U.S. Army Corps of Engineers and proper regulatory clearance obtained prior to any ground clearing or other land disturbing activities.

ccj_20150928

NRCS Soil Map-WSS



0 0.035 0.07 0.14 Miles

Legend

- Delineated Wetland Boundary
- JBER Wetland Inventory

Soil Classification Code

- 409
- 413
- 415
- 446
- 463

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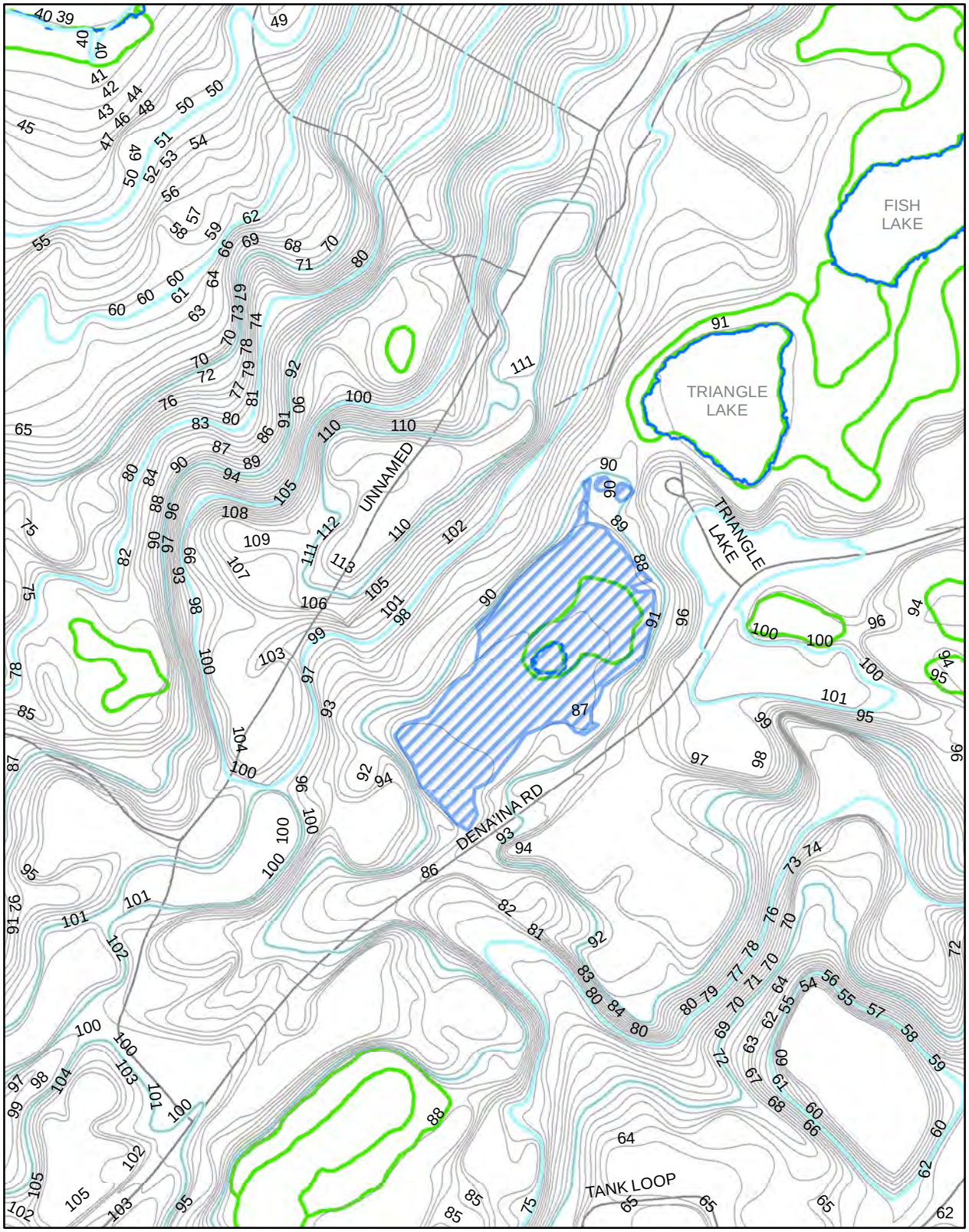
ccj_20150928

LiDAR Contour Map



0 0.05 0.1 0.2 Miles

Wetlands indicated by the green line on this map have been identified through an assessment of available electronic and mapping resources including but not limited to aerial photographs, topographic data, hydrography data, vegetative data, soil inventory, and other historic archives which indicated the likelihood of conditions suitable for the presence of wetlands. Wetlands depicted in blue hashmarking shown on this map have been delineated by a qualified wetland delineator, but have not been the subject of any field verification by the Corps of Engineers.
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Legend

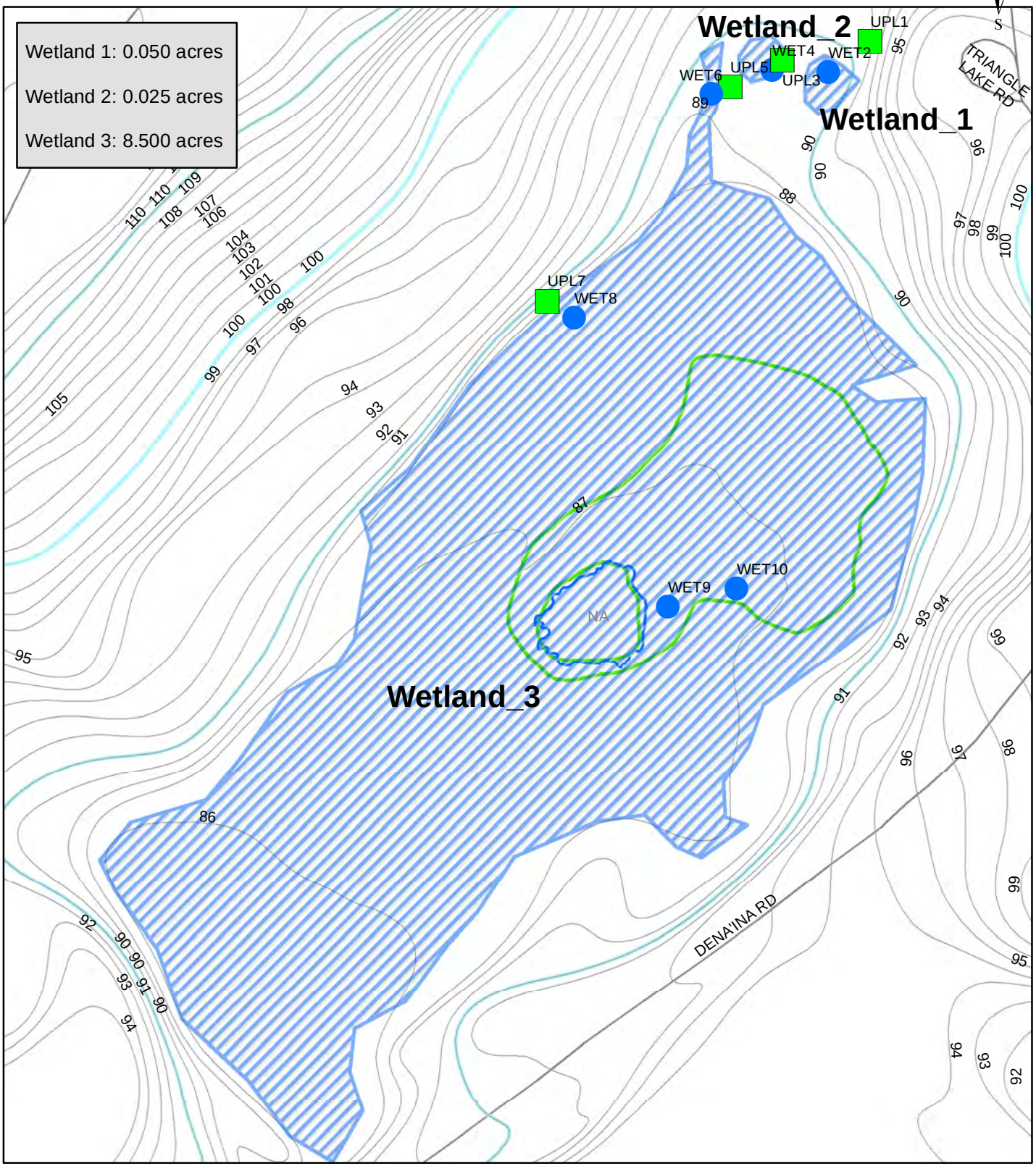
- Delineated Wetland Boundary

FXSB.ElevationContour

- 10m Smooth
- 1m Smooth
- JBER Wetland Inventory
- FXSB.NaturalWaterbody

ccj_20150928

Delineated Wetland Boundary



0 0.015 0.03 0.06 Miles

Wetlands indicated by the green line on this map have been identified through an assessment of available electronic and mapping resources including but not limited to aerial photographs, topographic data, hydrography data, vegetative data, soil inventory, and other historic archives which indicated the likelihood of conditions suitable for the presence of wetlands. Wetlands depicted in blue hashmarking shown on this map have been delineated by a qualified wetland delineator, and are subject to field verification by the Corps of Engineers.
This map is to be used only as a planning tool and not for regulatory purposes until the Corps of Engineers has conducted a review to determine if wetlands in this area are subject to regulatory control. If there are any ground disturbing activities planned for this area, a jurisdictional determination must be obtained from the U.S. Army Corps of Engineers and proper regulatory clearance obtained prior to any ground clearing or other land disturbing activities.

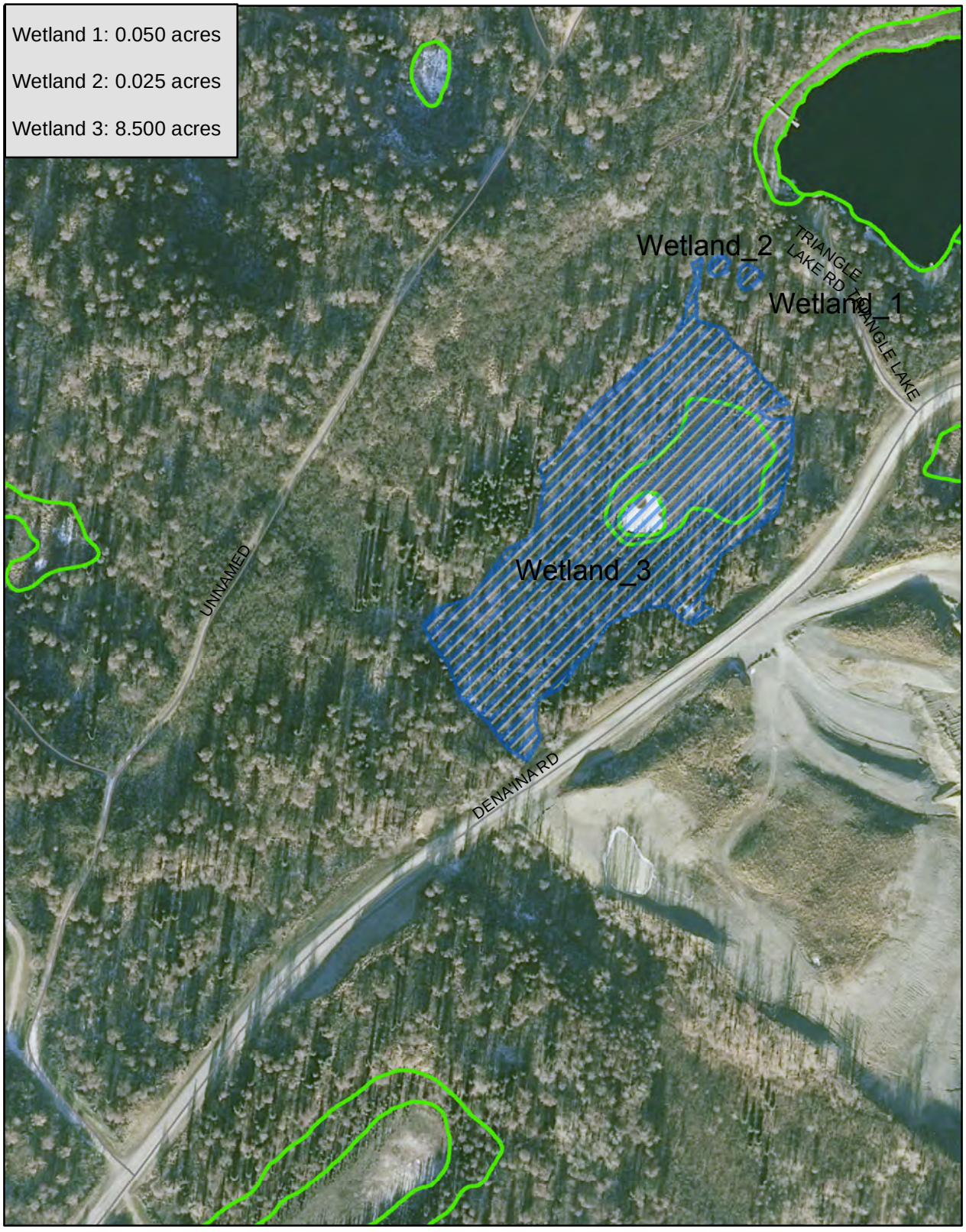
Legend

Test_Pit
- UPL
- WET
- Delineated Wetland Boundary
- JBER Wetland Inventory

FXSB.ElevationContour
- 10m Smooth
- 1m Smooth
- FXSB.NaturalWaterbody

ccj_20150928

Wetland Delineation Map



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Legend

- Delineated Wetland Boundary
- wetland_JBER_2014
- FXSB.RoadCenterline

ccj_20150928

APPENDIX A

USACE SITE DATA FORMS AND PHOTOGRAPHS

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 1- UPL1

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Rolling; hillside

Local relief (concave, convex, none): Convex Slope (%): 25-30%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.773N Long: 149 48'48.159W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes	☑ No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	☐ Yes	☑ No	
Wetland Hydrology Present?	☐ Yes	☑ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula neoalaskana	30	Y	FACU
2. Populus balsamifera	10	Y	FACU
3.			
4.			

Total Cover: 40

50% of total cover: 20 20% of total cover: 8

Sapling/Shrub Stratum			
1. Alnus incana	50	Y	FAC
2. Viburnum edule	30	Y	FACU
3. Rosa acicularis	15	N	FACU
4.			
5.			
6.			

Total Cover: 95

50% of total cover: 47.5 20% of total cover: 19

Herb Stratum			
1. Calamagrostis canadensis	40	Y	FAC
2. Chamaenerion angustifolium	20	Y	FACU
3. Matteuccia struthiopteris	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 80

50% of total cover: 40 20% of total cover: 16

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 5%

(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0%	x 1 =	0
FACW species	60	x 2 =	120
FAC species	50	x 3 =	150
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	215 (A)		690 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation was not. All trees and shrubs were identified.

SOIL

Sampling Point: UPL1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 2/2	100						Organic Duff/Sandy Loam
3-5"	10YR 3/2	100						Silty Loam
5-9"	10YR 3/4	100						Sandy Loam
9-16"	10YR 4/4	100						Sandy Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions at the base of steep slopes. Snowmelt settles in depressions and is released to ground water upon thaw. Silt loess/sandy loam over gravel till. Earthworms were found in soil sample. Adjacent Triangle Lake is a lake used for public fishing access.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 1- WET2

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Depression

Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.445N Long: 149 48'49.000W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PEM2C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	☑ Yes	☐ No	
Wetland Hydrology Present?	☑ Yes	☐ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Trees overhanging plot area are not rooted in the wetland			
2. and therefore are not included in this sample data.			
3.			
4.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum			
1. Alnus incana	30	Y	FAC
2. Rosa acicularis	10	Y	FACU
3.			
4.			
5.			
6.			

Total Cover: 40

50% of total cover: 20 20% of total cover: 8

Herb Stratum			
1. Calamagrostis canadensis	50	Y	FAC
2. Comarum palustre	20	Y	OBL
3. Equisetum sylvaticum	20		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 90

50% of total cover: 45 20% of total cover: 18

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 5%

(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation was not. All trees and shrubs were identified.

SOIL

Sampling Point: WET2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	7.5YR 3/2	98	10YR 3/4	<2%				Organic Duff/Silt Loam
5-16"	7.5YR 4/2	100	10YR 4/4	5%				Silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☑ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions at the base of steep slopes. Snowmelt settles in depressions and is released to ground water upon thaw. Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-stained Leaves (B9)
- ☑ Drainage Patterns (B10)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

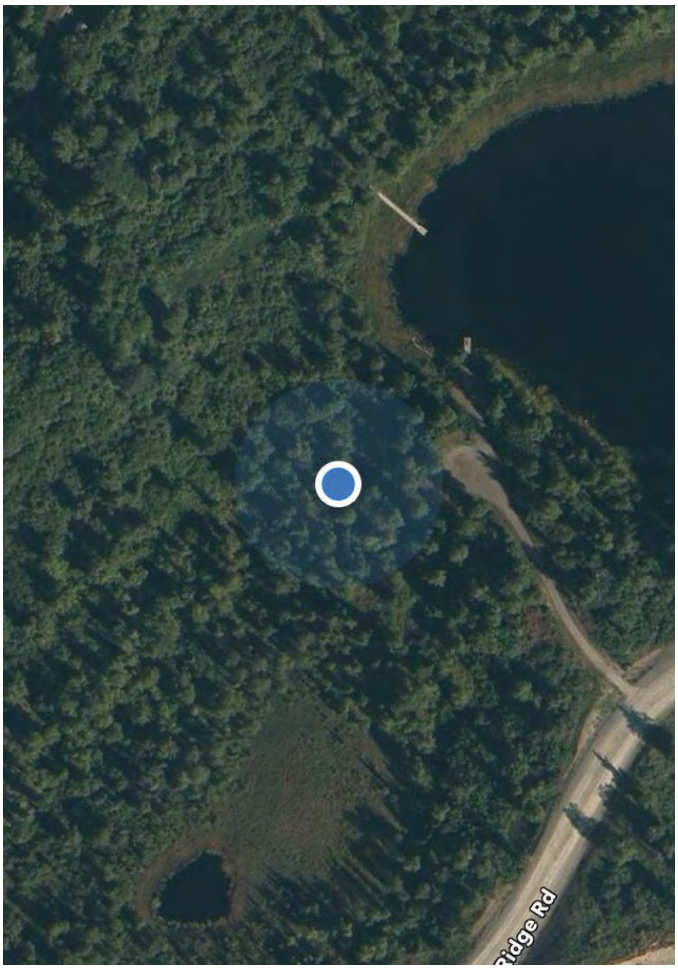
Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.



Wetland 1_ Sample Test Site WET2

UpperLeft: General Location.
Screen shot Google Maps

UpperRight: Soil Probe

LowerLeft: Wetland vegetation- Calamagrostis dominated; alder dominated slope visible to rear.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA RedHorse Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 2- UPL3

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Rolling; hillside

Local relief (concave, convex, none): Convex Slope (%): 25-30%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.543"N Long: 149 48'49.976"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes	☑ No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	☐ Yes	☑ No	
Wetland Hydrology Present?	☐ Yes	☑ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula neoalaskana	45	Y	FACU
2. Picea glauca	15	Y	FACU
3.			
4.			

Total Cover: 60

50% of total cover: 30 20% of total cover: 12

Sapling/Shrub Stratum			
1. Rosa acicularis	40	Y	FACU
2. Alnus incana	20	Y	FAC
3. Viburnum edule	10	N	FACU
4.			
5.			
6.			

Total Cover: 70

50% of total cover: 35 20% of total cover: 14

Herb Stratum			
1. Calamagrostis canadensis	40	Y	FAC
2. Chamaenerion angustifolium	20	Y	FACU
3. Matteuccia struthiopteris	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 80

50% of total cover: 40 20% of total cover: 16

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 15 (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	60	x 3 =	180
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	210 (A)		740 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation diversity and abundance was not. All trees and shrubs were identified.

SOIL

Sampling Point: UPL3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 2/2	100						Organic Duff/Sandy Loam
3-5"	10YR 3/2	100						Silty Loam
5-9"	10YR 3/4	100						Sandy Loam
9-16"	10YR 4/4	100						Sandy Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ **No** X

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions (wetlands) at the base of steep slopes (uplands). Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 2-WET4

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Depression

Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.444N Long: 149 48'50.176W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PEM2C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	☑ Yes	☐ No	
Wetland Hydrology Present?	☑ Yes	☐ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Trees overhanging plot area are not rooted in the wetland			
2. and therefore are not included in this sample data.			
3.			
4.			

Total Cover: 0

50% of total cover: 0 20% of total cover: _____

Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
6.			

Total Cover: 0

50% of total cover: 0 20% of total cover: 0

Herb Stratum			
1. Calamagrostis canadensis	50	Y	FAC
2. Iris setosa	20	Y	FAC
3. Equisetum sylvaticum	30	Y	FAC
4. Comarum palustre	10	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 110

50% of total cover: 55 20% of total cover: 22

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 20 (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation species and abundance was not. All trees and shrubs were identified.

SOIL

Sampling Point: WET4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4"	7.5YR 3/2	100						Organic Duff/Silt Loam
4-12"	7.5YR 3/1	95	7.5YR 3/4	5%	D	PL		Silt loam
12+								Coarse gravel/rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☑ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions at the base of steep slopes. Snowmelt settles in depressions and is released to ground water upon thaw. Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-stained Leaves (B9)
- ☑ Drainage Patterns (B10)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): None

Water Table Present? Yes ☐ No ☑ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 5"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

Above: Wetland 2- Top: Depression basin bottom and slope (facing west)

Left: Wetland - Bottom: Depression bottom (facing south)

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3-UPL5

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Rolling; hillside

Local relief (concave, convex, none): Convex Slope (%): 25-30%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.256"N Long: 149 48'51.03"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes	☑ No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	☐ Yes	☑ No	
Wetland Hydrology Present?	☐ Yes	☑ No	

Remarks:

Dryer than normal in August (within a month of the sampling date); Near normal in Sept. Upland is a sloped ridge between Wetland 2 and the drainageway of Wetland 3.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	40	Y	FACU
2. Betula neoalaskana	20	Y	FACU
3. Picea glauca	20	Y	FACU
4.			

Total Cover: 80

50% of total cover: 40 20% of total cover: 15

Sapling/Shrub Stratum			
1. Alnus incana	50	Y	FAC
2. Rosa acicularis	20	Y	FACU
3. Sorbus sitchensis	10	Y	FACU
4. Viburnum edule	5	N	FACU
5.			
6.			

Total Cover: 85

50% of total cover: 42.5 20% of total cover: 17

Herb Stratum			
1. Calamagrostis canadensis	40	Y	FAC
2. Oplopanax horridus	40	Y	FACU
3. Matteuccia struthiopteris	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 100

50% of total cover: 50 20% of total cover: 20

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 20 (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation diversity and abundance was not. All trees and shrubs were identified.

SOIL

Sampling Point: UPL5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 2/2	100						Organic Duff/Sandy Loam
3-5"	10YR 3/2	100						Silty Loam
5-9"	10YR 3/4	100						Sandy Loam
9-12"	10YR 4/4	100						Sandy Loam
12+								Coarse gravel/Rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions (wetlands) at the base of steep slopes (uplands). Silt loess/sandy loam over gravel till. Drainageway ground feature slopes upward (in a northerly direction) in elevation but does not connect to Triangle Lake via any surface water connection.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3-WET6

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Drainageway

Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'12.171"N Long: 149 48'51.418"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PSS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	☑ Yes	☐ No	
Wetland Hydrology Present?	☑ Yes	☐ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera**	30	NA	FACU
2. Picea glauca**	20	NA	FACU
3. Betula neoalaskana**	20	NA	FACU
4. **Trees are not rooted within the wetland area but do overhang.			

Total Cover: 0

50% of total cover: 0 20% of total cover: 0

Sapling/Shrub Stratum			
1. Alnus incana	70	Y	FACW
2. Viburnum edule	10	N	FACU
3. Rosa acicularis	5	N	FACU
4.			
5.			
6.			

Total Cover: 85

50% of total cover: 42.5 20% of total cover: 17

Herb Stratum			
1. Calamagrostis canadensis	50	Y	FAC
2. Equisetum sylvaticum	30	Y	FAC
3. Matteuccia struthiopteris	20	N	FACW
4. Oplopanax horridus	15	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 115

50% of total cover: 57.5 20% of total cover: 23

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation species and abundance was not. All trees and shrubs were identified.

SOIL

Sampling Point: WET6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3"	7.5YR 3/2	100						Organic Duff/Silt loam
3-7"	7.5YR 3/3	88	10YR 4/4	10%	D	M		Silt loam
			10YR 4/6	2%	D	PL		Silt loam
7-12	7.5YR 4/2	98	7.5YR 3/4	5%	D	M		Silt loam
12+								Rock/Coarse Gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☑ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions at the base of steep slopes. Snowmelt settles in depressions and is released to ground water upon thaw. Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-stained Leaves (B9)
- ☑ Drainage Patterns (B10)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): None

Water Table Present? Yes ☐ No ☑ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 4"

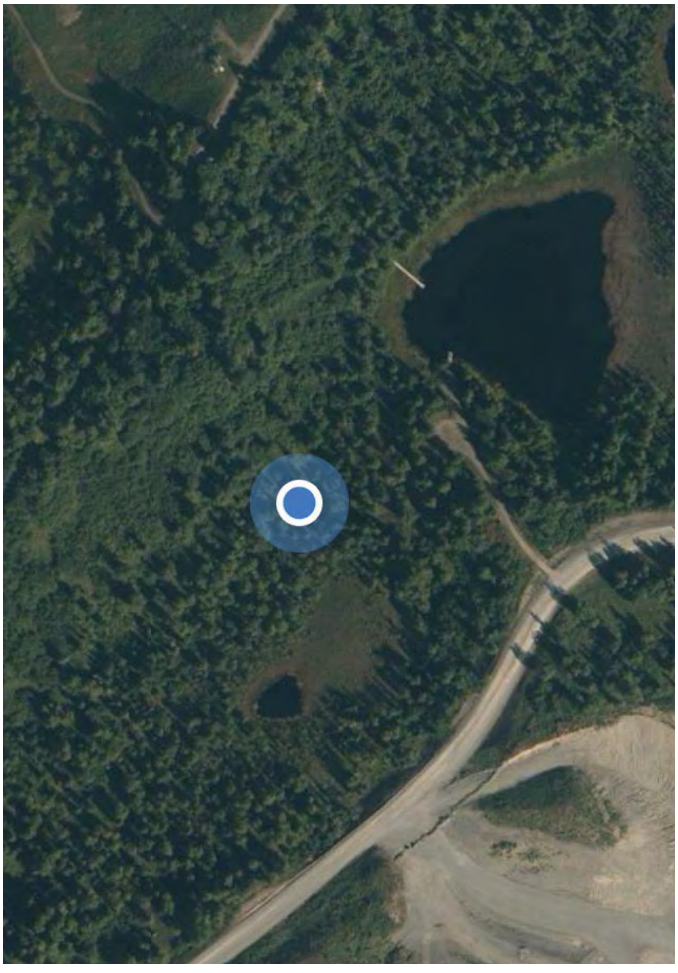
Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.



Wetland 3

Delineation began in a drainage way in the northeast corner of the wetland. The drainage does not connect to Triangle Lake. Drainage begins at the top of a ridge just north of the mapped wetland and flows downhill southwest into the wetland basin.

Upper left: Soil probe profile.

Upper right: Basin sideslope (within drainageway)

Lower left: Google maps aerial photograph (screenshot)

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3-UPL7

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Rolling; hillside

Local relief (concave, convex, none): Convex Slope (%): 25-30%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'10.029"N Long: 149 48' 54.647"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes	☑ No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	☐ Yes	☑ No	
Wetland Hydrology Present?	☐ Yes	☑ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula neoalaskana	50	Y	FACU
2. Picea glauca	20	Y	FACU
3. Populus balsamifera	10	N	FACU
4.			

Total Cover: 80

50% of total cover: 40 20% of total cover: 16

Sapling/Shrub Stratum			
1. Sorbus sitchensis	30	Y	FACU
2. Rosa acicularis	20	Y	FACU
3. Alnus incana	15	N	FAC
4. Viburnum edule	15	N	FACU
5.			
6.			

Total Cover: 80

50% of total cover: 40 20% of total cover: 16

Herb Stratum			
1. Calamagrostis canadensis	50	Y	FAC
2. Chamaenerion angustifolium	20	Y	FACU
3. Lycopodium sp.	25	Y	FACU
4. Achillea millefolium	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 100

50% of total cover: 50 20% of total cover: 20

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes 50%
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation diversity and abundance was not. All trees and shrubs were identified.

SOIL

Sampling Point: UPL7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 2/2	100						Organic Duff/Sandy Loam
3-5"	10YR 3/2	100						Silty Loam
5-9"	10YR 3/4	100						Sandy Loam
9-12"	10YR 4/4	100						Sandy Loam
12+								Coarse gravel/Rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)
- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ TF12 very Shallow Dark Surface
- ☐ Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions (wetlands) at the base of steep slopes (uplands). Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes _____ **No** X

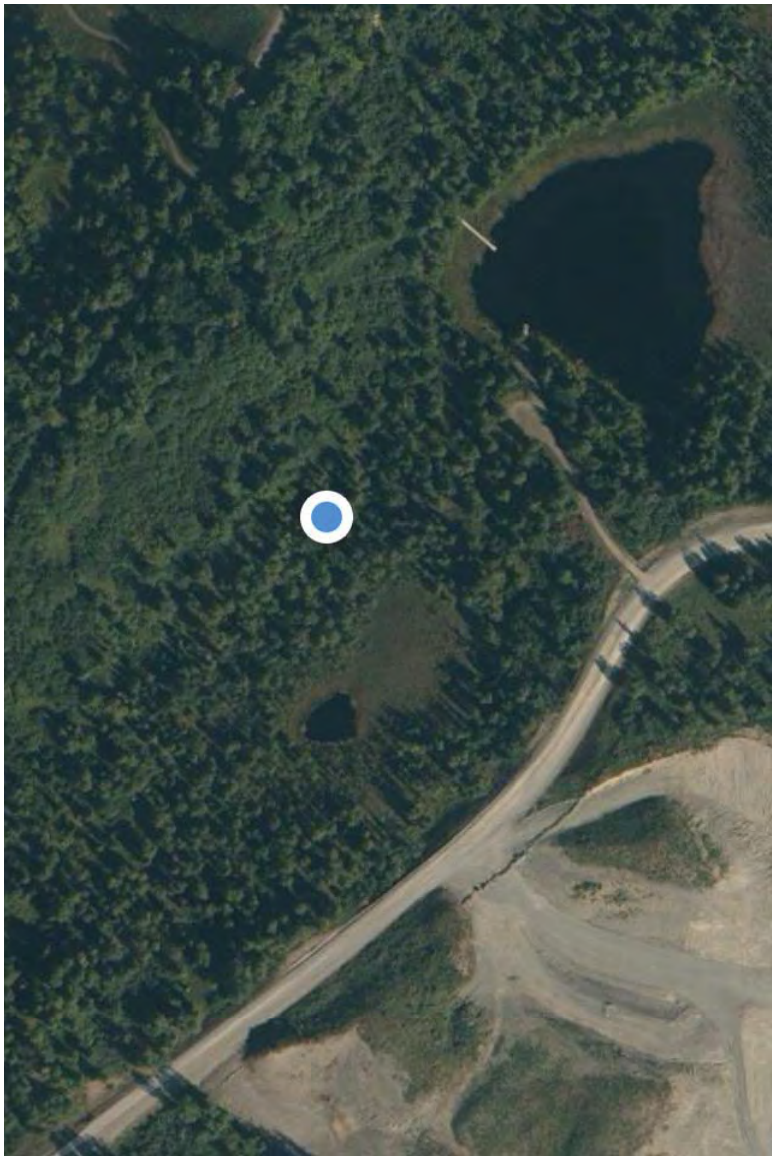
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

Google Earth image on the left shows approximate location of photo vantage for W3-
ET6 shown in photo on the right. Photo on the right shows upland data point area along the hillside toe of slope.



WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3- WET8

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Depression

Local relief (concave, convex, none): Concave Slope (%): <2%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'9.876"N Long: 149 48'54.071"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PSS1B/C; PEM1B/C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____X____ No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes___X_ No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	☑ Yes	☐ No	
Wetland Hydrology Present?	☑ Yes	☐ No	

Remarks:
Dryer than normal in August (within a month of the sampling date); Near normal in Sept. Multigradient wetland system contains a forested/shrub carr edge (described here).

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula papyrifera (neoalaskana) (Buttressed)	40	Y	FAC*
2. Picea glauca (narrow/stunted)	10	Y	FAC*
3.			
4.			

Total Cover: 50

50% of total cover: 25 20% of total cover: 10

Sapling/Shrub Stratum			
1. Alnus incana	30	Y	FAC
2. Betula papyrifera (seedlings/saplings; lacking morph at this stage))	10	Y	FACU
3.			
4.			
5.			
6.			

Total Cover: 40

50% of total cover: 20 20% of total cover: 8

Herb Stratum			
1. Calamagrostis canadensis	80	Y	FAC
2. Equisetum sylvaticum	30	Y	FAC
3. Matteuccia struthiopteris	5	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: 115

50% of total cover: 57.5 20% of total cover: 23

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☑ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] (*)Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Morphologicial adaptations including buttressed birch and stunted white spruce.

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation was not. All trees and shrubs were identified.

SOIL

Sampling Point: WET8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5"	10YR 2/1	100						Organic
5-14"	10YR 3/1	100						Organic (min. sandy loam)
14+								Rock/Gravel.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [x] Histosol or Histel (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Thick Dark Surface (A12)
- [ ] Alaska Gleyed (A13)
- [ ] Alaska Redox (A14)
- [ ] Alaska Gleyed Pores (A15)
- [ ] Alaska Color Change (TA4)[4]
- [ ] Alaska Alpine Swales (TA5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] TF12 very Shallow Dark Surface
- [ ] Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: Gravel/Rock

Depth (inches): 14"

Below the toe of slope; soil was rich organic with a minimal sandy loam component overlaying a dense gravel/rock layer.

Hydric Soil Present? Yes X No ____

Remarks:

Anchorage Soil Survey- Deception-Estelle-Kitchatna (complex, undulating, steep) accurately describes this soil unit. The Elmendorf moraine is pocketed with depressions at the base of steep slopes. Snowmelt settles in depressions and is released to ground water upon thaw. Silt loess/sandy loam over gravel till.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Marl Deposits (B15)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Dry-Season Water Table (C2)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [x] Water-stained Leaves (B9)
- [x] Drainage Patterns (B10)
- [x] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Salt Deposits (C5)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No [x] Depth (inches): ____

Water Table Present? Yes [x] No ____ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes [x] No ____ Depth (inches): 2"

Wetland Hydrology Present? Yes X No ____

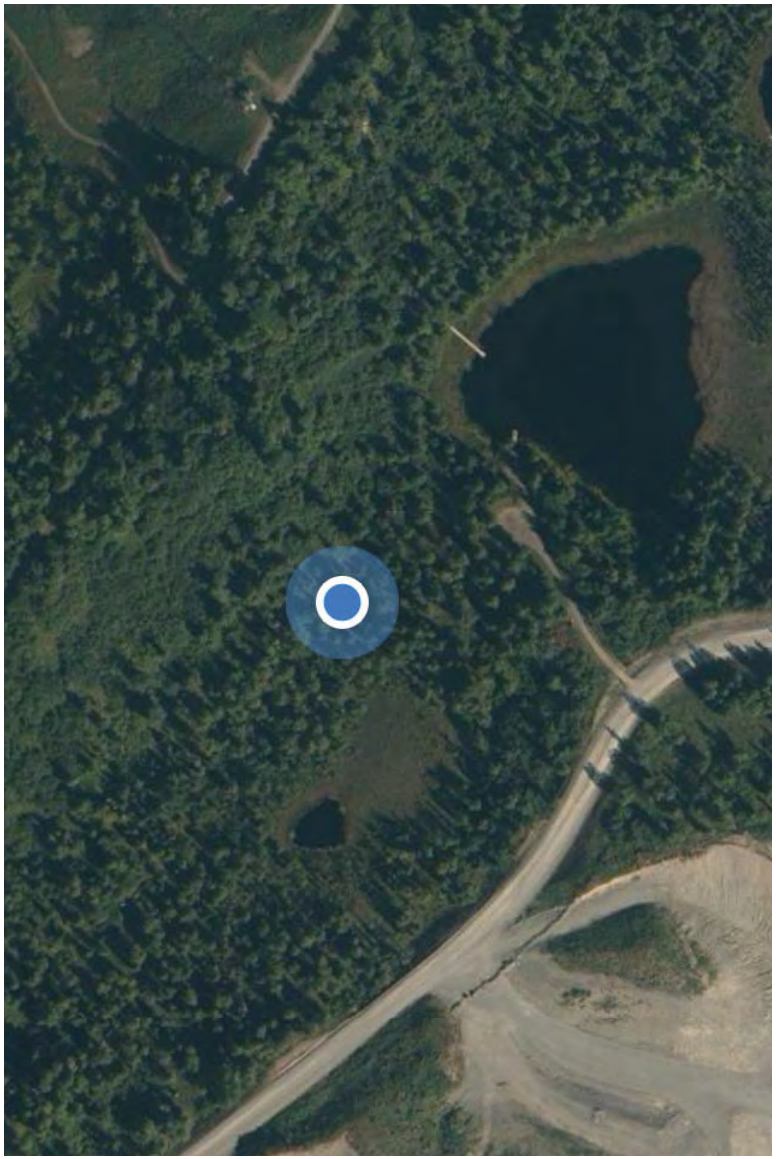
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

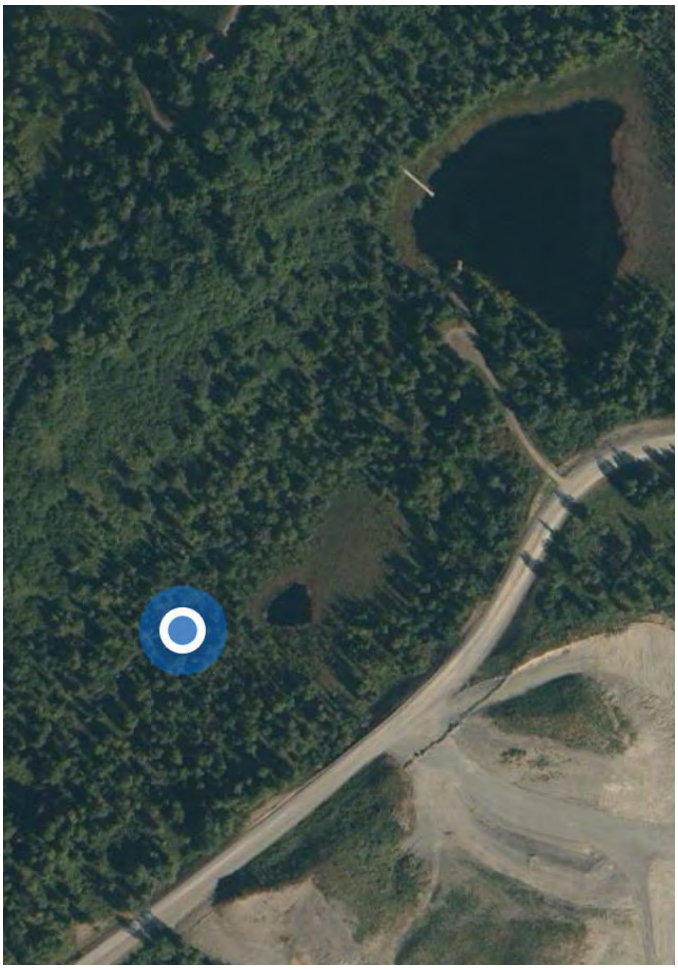
Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". The recent difference in precipitation (August being 2.28" less than normal) may be a factor in low soil moisture observed in the test pits.

Google Earth screenshot on the left shows approximate location of photo vantage on the right.



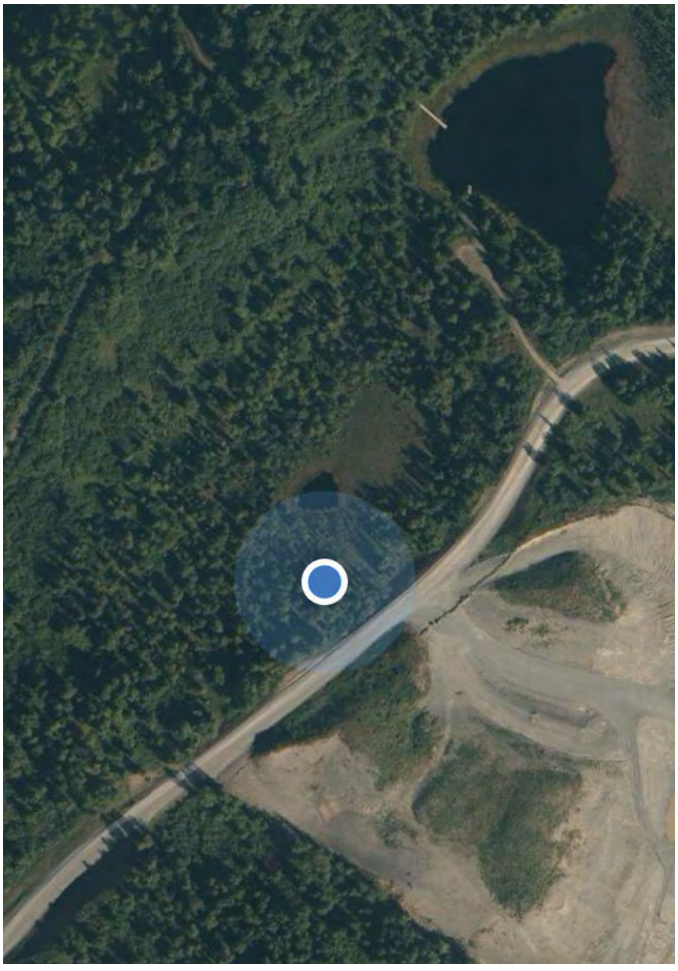
PSS1/EM1B/C. Wetland type exists along a gradient. Dominated by birch on the edge; then by stunted white and black spruce; then extremely stunted black spruce in floating mat nearest the ponded core.

Additional photos on the following page shows other areas of the wetland complex. The wetland boundary was delineated based primarily on the toe of slope of the hillside and secondarily on the organic content in the soil- which changed markedly just beyond the toe of slope. Periodic soil samples were taken with an Eijkelkamp probe to monitor the progression of the wetland boundary marking.



Google Earth snapshot on left shows approximate location for photo vantage on right.

Above: West end of Wetland 3: greater percentage cover by spruce than birch. Some areas of standing water.



Google Earth snapshot on left shows approximate location for photo vantage on right.

Above: Southwest corner of wetland.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3- WET9

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Depression, open water

Local relief (concave, convex, none): Concave Slope (%): <2%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'7.035"N Long: 149 48'51.942"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PAB4H0 (freshwater)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	Sample taken at his location to characterize inclusion wetlands.
Hydric Soil Present?	☑ Yes	☐ No	**Is the Sampled Area**
Wetland Hydrology Present?	☑ Yes	☐ No	**within a Wetland?** **Yes** X **No** _____

Remarks:

Water levels in pond appear normal, despite low precipitation in August. Pond is bordered by a floating mat indicating the presence of a larger natural open water body, historically. This sample was taken from the edge of the floating mat.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover: 0			
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum			
1. Myrica gale	15	Y	OBL
2. Vaccinium oxycoccos	5	Y	OBL
3.			
4.			
5.			
6.			
Total Cover: 20			
50% of total cover: 10	20% of total cover: 5		
Herb Stratum			
1. Stuckenia pectinata	30	Y	OBL
2. Nuphar polysepalum	30	Y	OBL
3. Menyanthes trifoliata	20	Y	OBL
4. Carex lyngbyaei	10		
5. Other non-dominant forbs were not identifiable at the time of sampling)			
6.			
7.			
8.			
9.			
10.			
Total Cover: 90			
50% of total cover: 45	20% of total cover: 18		

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 100% open water

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] (*)Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation was not. Sample taken at edge of floating mat.

SOIL

Sampling Point: WET8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	Organic							Floating mat (edge)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [x] Histosol or Histel (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Thick Dark Surface (A12)
- [ ] Alaska Gleyed (A13)
- [ ] Alaska Redox (A14)
- [ ] Alaska Gleyed Pores (A15)
- [ ] Alaska Color Change (TA4)[4]
- [ ] Alaska Alpine Swales (TA5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] TF12 very Shallow Dark Surface
- [ ] Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: Gravel/Rock

Depth (inches): 14"

Below the toe of slope; soil was rich organic with a minimal sandy loam component overlaying a dense gravel/rock layer.

Hydric Soil Present? Yes X No ____

Remarks:

Water depth was greater than 2-ft when sampled. The bathymetry of this pond is not known, nor is the extent of open water beneath the floating mat. The substrate is assumed to be organic over mineral, per Anchorage Soil Survey. Emergent vegetation is limited to within 12" from the edge of the floating mat. Rooting zone for floating leaved vegetation is limited to within 10 or so feet from the edge of the floating mat.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Surface Soil Cracks (B6)
- [x] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Marl Deposits (B15)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Dry-Season Water Table (C2)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water-stained Leaves (B9)
- [ ] Drainage Patterns (B10)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Salt Deposits (C5)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes [x] No [ ] Depth (inches): >24"

Water Table Present? Yes [x] No [ ] Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes [x] No [ ] Depth (inches): _____

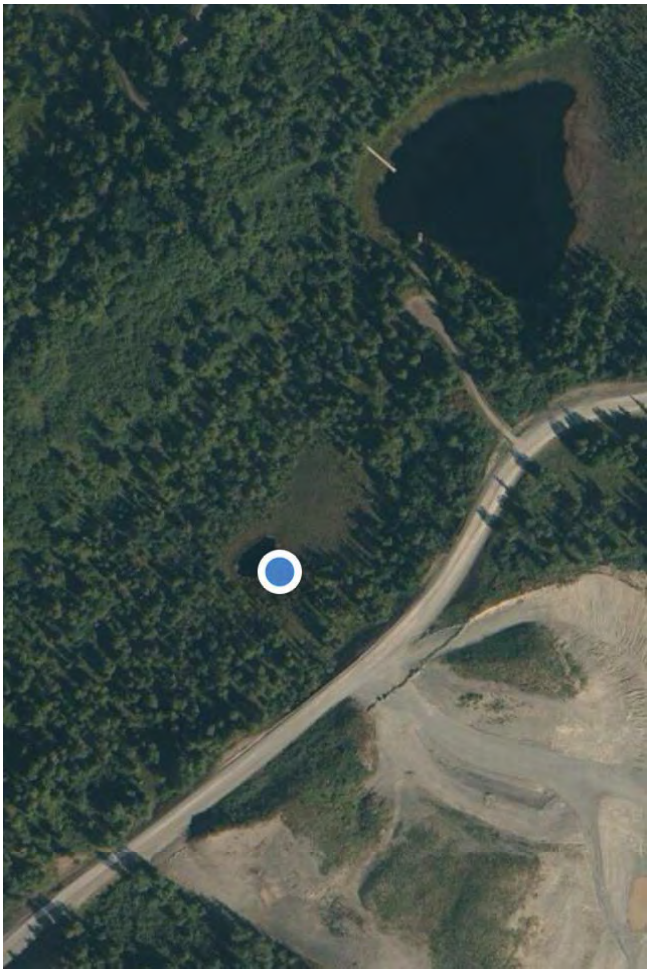
Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2".



Google Earth image on the left indicates that approximate location of the photo vantage shown in the photo below (facing west).

The pond is a permanent water body, bordered by a floating sphagnum mat dominated by sedges and low shrubs. Total pond area (as measured on 2012 aerial photograph) is 0.14 acres.

Sample Site #10 is taken from a vantage immediately east facing from this vantage. the mat is thicker the further from the edge of the pond, though the bottom depth was not determined during sampling. This pond freezes over in winter.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: F22-DOPPA Elmendorf Flight Line Safety Project Borough/City: JBER, Alaska Sampling Date: 25 Sept 2015

Applicant/Owner: United States Air Force Sampling Point: Wetland 3- WET10

Investigator(s): Charlene Johnson, P.W.S. #1868 Landform (hillside, terrace, hummocks, etc.): Depression

Local relief (concave, convex, none): Concave Slope (%): <2%

Subregion: South Central Alaska (Coastal/Inland) Lat: 61 16'7.226"N Long: 149 48'50.514"W Datum: WGS 1984

Soil Map Unit Name: Deception-Estelle-Kitchatna; (undulating and steep) NWI classification: PSS1/FO4Bg floating mat over relict lake)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	Sample taken at his location to characterize inclusion wetlands.
Hydric Soil Present?	☑ Yes	☐ No	**Is the Sampled Area**
Wetland Hydrology Present?	☑ Yes	☐ No	**within a Wetland?** **Yes** X **No** _____

Remarks:

Dryer than normal in August (within a month of the sampling date); Near normal in Sept. Pond is bordered by a floating mat indicating larger natural open water area historically. Sample taken from edge of mat.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea mariana (stunted/dwarfed)	5	Y	
2.			
3.			
4.			
Total Cover: 5%			
50% of total cover: 2.5	20% of total cover: 1		
Sapling/Shrub Stratum			
1. Myrica gale	40	Y	OBL
2. Betula glandulosa	20	Y	FAC
3. Chamaedaphne calyculata	15	Y	FACW
4. Vaccinium oxycoccos	5	N	OBL
5. Rhododendron tomentosum	5	N	FACW
6.			
Total Cover: 85			
50% of total cover: 42.5	20% of total cover: 17		
Herb Stratum			
1. Carex lyngbyaei	30	Y	OBL
2. Carex spp.	20	Y	OBL
3. Eriophorum sp.	30	Y	OBL
4. Calamagrostis canadensis	5	N	
5. Comarum palustre	5	N	
6. Other non-dominant forbs were not identifiable at the time of sampling)			
7.			
8.			
9.			
10.			
Total Cover: 90			
50% of total cover: 45	20% of total cover: 18		

Plot size (radius, or length x width) T=30'; S=10'; H=3' % Bare Ground 0

% Cover of Wetland Bryophytes 100% (Where applicable) Total Cover of Bryophytes 100%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1](*)Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

All vegetation was senesced. While dominant vegetation was identifiable, non-dominant vegetation was not.

SOIL

Sampling Point: WET10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	Organic							Floating mat >16" thick

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [x] Histosol or Histel (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Thick Dark Surface (A12)
- [ ] Alaska Gleyed (A13)
- [ ] Alaska Redox (A14)
- [ ] Alaska Gleyed Pores (A15)
- [ ] Alaska Color Change (TA4)[4]
- [ ] Alaska Alpine Swales (TA5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] TF12 very Shallow Dark Surface
- [ ] Other (Explain in Remarks)[3]

[3]Refer to the Alaska Regional Supplement for Problematic Hydric Soils

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Below the toe of slope; soil was rich organic with a minimal sandy loam component overlaying a dense gravel/rock layer.

Hydric Soil Present? Yes X No _____

Remarks:

The bathymetry of the relict pond beneath the floating mat is not known. The substrate is assumed to be organic over mineral, per Anchorage Soil Survey.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Marl Deposits (B15)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Dry-Season Water Table (C2)
- [x] Other (Explain in Remarks)

Floating mat

Secondary Indicators (2 or more required)

- [ ] Water-stained Leaves (B9)
- [ ] Drainage Patterns (B10)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Salt Deposits (C5)
- [x] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☑ No ☐ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0"

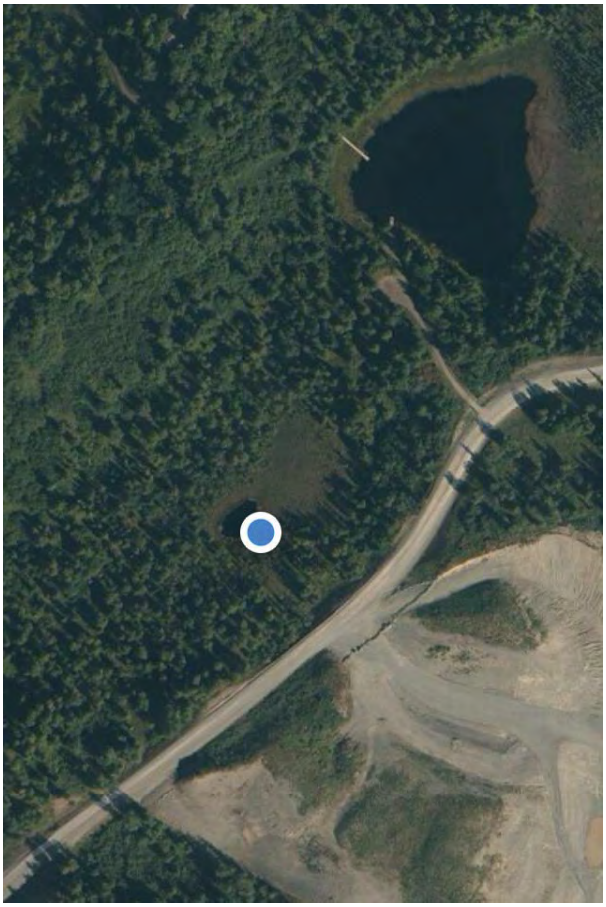
Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Climatological data from The Alaska Climate Research Center (akclimate.org/summary/statewide/2(

Remarks:

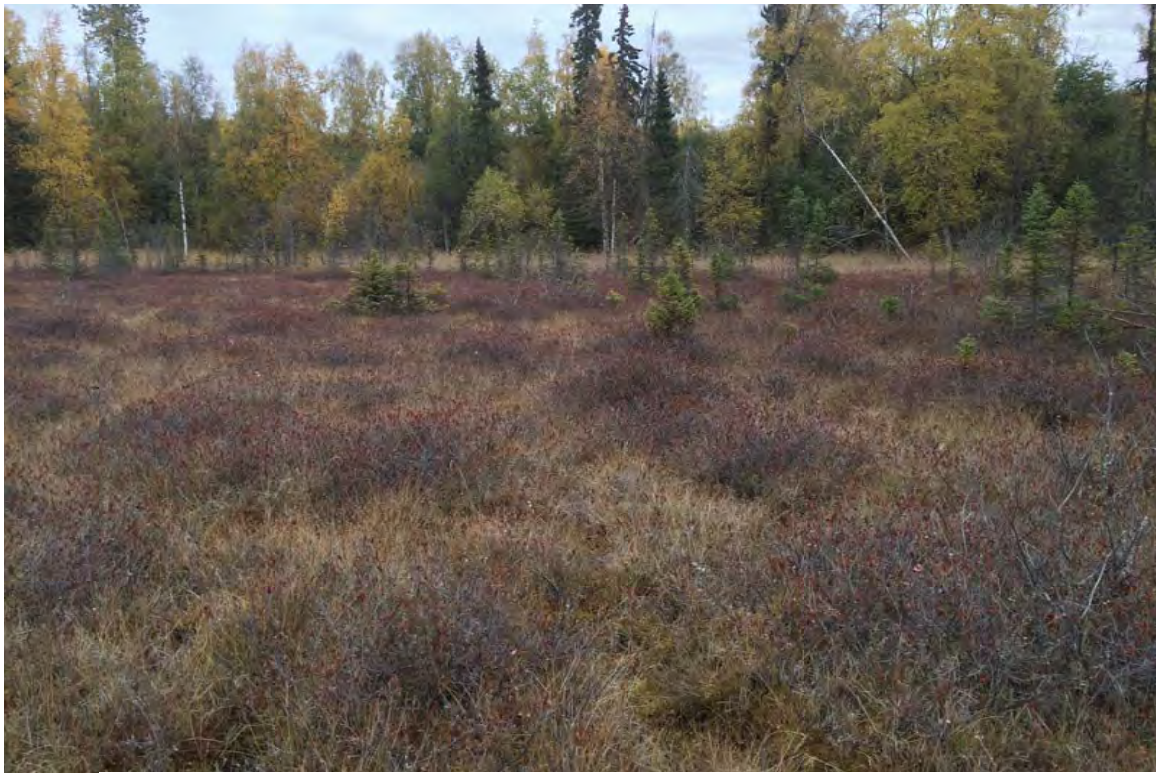
Mean Normal (30yr) Precipitation in Anchorage: 2.99 (September); Normal (30 yr) cumulative through Sept: 12.28". Current Precipitation 2.8" (September); Current Cumulative through 26 Sept. 2015: 10.2". Water table present immediately beneath the floating mat surface.



Google Earth image on the left indicates that approximate location of the photo vantage shown in the photo below (facing east).

A portion of this portion of the wetland is floating sphagnum mat bordering an relict pond inclusion. The depth of the water below the floating mat is not known.

Total bog area (as measured on 2012 aerial photograph) is 2.6 acres.



APPENDIX B

JURISDICTIONAL WETLAND DETERMINATION FOR ADJACENT WETLANDS: POA-2014-513

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, ALASKA 99506-0898
MAY 15 2015

Regulatory Division
POA-2014-531

673 CES/CEIEC
Attention: Mr. Brent Koenen
724 Postal Service Loop #4500
JBER, Alaska 99505-4500

Dear Mr. Koenen:

This is in response to your December 9, 2014, letter regarding a jurisdictional determination for parcels of land located within Section 27, T. 14 N., R. 3 W., Seward Meridian; USGS Quad Map Anchorage B-8; Latitude 61.2713° N., Longitude 149.7946° W.; on JBER, Alaska.

Based on our review of the information you provided and available to us, we have determined that the subject project will not involve placement of dredged and/or fill material into waters of the U.S. under our regulatory jurisdiction. The wetlands in the review area are isolated, intrastate, non-navigable, and have no connection to interstate or foreign commerce. Therefore, pursuant to the federal guidance on the Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, a DA permit is not required. A copy of the Approved Jurisdictional Determination form is available at: www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

This jurisdictional determination does not establish any precedent with respect to any other jurisdictional determination under Section 404 of the Clean Water Act.

Your proposed project was reviewed pursuant to Section 404 of the Clean Water Act which 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 wetlands, prior to conducting the work (33 U.S.C. 1344).

For regulatory purposes, the Corps of Engineers 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.

This approved jurisdictional determination is valid for a period of five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Also, enclosed is a Notification of Administrative Appeals Options and Process and Request for Appeal form regarding this approved jurisdictional determination (see section labeled "Approved Jurisdictional Determination").

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact Blake Romero via email at Blake.A.Romero@usace.army.mil, by mail at the address above, by phone at (907) 753-2735, or toll free from within Alaska at (800) 478-2712, if you have questions.

Sincerely,

Shannon Morgan

Shannon Morgan
Chief, South Branch

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: 673 CES/CEIEC	File Number: POA-2014-531	Date: May 4, 2015
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

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:

Blake Romero, Regulatory Specialist
Alaska District Corps of Engineers
CEPOA-RD-S
P.O. Box 6898
JBER, AK 99506-0898
(907) 753-2735

If you only have questions regarding the appeal process you may also contact:

Commander
USAED, Pacific Ocean Division
ATTN: CEPOD-PDC/Cindy Barger
Building 525
Fort Shafter, HI 96858-5440

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.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

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): February 9, 2015

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Alaska District, POA-2014-531 – 673 CES/CEIEC

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Alaska City: Joint Base Elmendorf-Richardson
Center coordinates of site (lat/long in degree decimal format): Lat. 61.2713 ° N, Long. 149.7946 °W
Name of nearest waterbody: Fish Lake
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Cook Inlet
Name of watershed or Hydrologic Unit Code (HUC): 19020401

☑ 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: March 4, 2015

☐ Field Determination. Date(s): *Click here to enter a date., Click here to enter a date.*

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.

☐ 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: *Click here to enter text.*

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):**

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☐ Relatively permanent waters (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

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: # linear feet: # width (ft) and/or # acres.
   Wetlands: # acres.

   c. **Limits (boundaries) of jurisdiction** based on: *Choose an item.*

   Elevation of established OHWM (if known): *Click here to enter text.*

2. **Non-regulated waters/wetlands (check if applicable):**

☑ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The subject wetland was determined to be an isolated water of the U.S.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

1. TNW

Identify TNW: *Click here to enter text.*

Summarize rationale supporting determination: *Click here to enter text.*

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": *Click here to enter text.*

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: # *Choose an item.*
Drainage area: # *Choose an item.*

Average annual rainfall: # inches
Average annual snowfall: # inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☐ Tributary flows through *Choose an item.* tributaries before entering TNW.

Project waters are *Choose an item.* river miles from TNW.
Project waters are *Choose an item.* river miles from RPW.
Project waters are *Choose an item.* aerial (straight) miles from TNW.
Project waters are *Choose an item.* aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: *Click here to enter text.*

Identify flow route to TNW: *Click here to enter text.*
Tributary stream order, if known: *Click here to enter text.*

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain: *Click here to enter text.*

☐ Manipulated (man-altered). Explain: *Click here to enter text.*

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: *Click here to enter text.*
☐ Other. Explain: *Click here to enter text.*

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: *Click here to enter text.*
Presence of run/riffle/pool complexes. Explain: *Click here to enter text.*
Tributary geometry: *Choose an item.*
Tributary gradient (approximate average slope): #%

(c) Flow:

Tributary provides for: *Choose an item.*
Estimate average number of flow events in review area/year: *Choose an item.*
Describe flow regime: *Click here to enter text.*
Other information on duration and volume: *Click here to enter text.*

Surface flow is: *Choose an item.* Characteristics: *Click here to enter text.*

Subsurface flow: *Choose an item.* Explain findings: *Click here to enter text.*
☐ Dye (or other) test performed: *Click here to enter text.*

Tributary has (check all that apply):
☐ Bed and banks

- ☐ OHWM (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list): *Click here to enter text.*
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community *Click here to enter text.*
- ☐ Discontinuous OHWM. Explain: *Click here to enter text.*

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list): *Click here to enter text.*
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: *Click here to enter text.*

Identify specific pollutants, if known: *Click here to enter text.*

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): *Click here to enter text.*
- ☐ Wetland fringe. Characteristics: *Click here to enter text.*
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: *Click here to enter text.*
  - ☐ Fish/spawn areas. Explain findings: *Click here to enter text.*
  - ☐ Other environmentally-sensitive species. Explain findings: *Click here to enter text.*
  - ☐ Aquatic/wildlife diversity. Explain findings: *Click here to enter text.*

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: *Click here to enter text.*

Wetland quality. Explain: *Click here to enter text.*

Project wetlands cross or serve as state boundaries. Explain: *Click here to enter text.*

(b) General Flow Relationship with Non-TNW:

Flow is: *Choose an item.* Explain: *Click here to enter text.*

Surface flow is: *Choose an item.*

Characteristics: *Click here to enter text.*

Subsurface flow: *Choose an item.* Explain findings: *Click here to enter text.*

- ☐ Dye (or other) test performed: *Click here to enter text.*

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: *Click here to enter text.*
  - ☐ Ecological connection. Explain: *Click here to enter text.*
  - ☐ Separated by berm/barrier. Explain: *Click here to enter text.*

(d) Proximity (Relationship) to TNW

Project wetlands are *Choose an item.* river miles from TNW.

Project waters are *Choose an item.* aerial (straight) miles from TNW.

Flow is from: *Choose an item.*

Estimate approximate location of wetland as within the *Choose an item.* 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: *Click here to enter text.*

Identify specific pollutants, if known: *Click here to enter text.*

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): *Click here to enter text.*
- ☐ Vegetation type/percent cover. Explain: *Click here to enter text.*
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: *Click here to enter text.*
  - ☐ Fish/spawn areas. Explain findings: *Click here to enter text.*
  - ☐ Other environmentally-sensitive species. Explain findings: *Click here to enter text.*
  - ☐ Aquatic/wildlife diversity. Explain findings: *Click here to enter text.*

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: *Choose an item.*

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: *Click here to enter text.*

C. SIGNIFICANT NEXUS DETERMINATION

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: *Click here to enter text.*

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: *Click here to enter text.*

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: *Click here to enter text.*

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: # linear feet # width (ft), Or, # acres.
   - ☐ Wetlands adjacent to TNWs: # acres.

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: *Click here to enter text..*
   - ☐ 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: *Click here to enter text..*

   Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters:

3. **Non-RPWs 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):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters: *Click here to enter text.*

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: *Click here to enter text.*

☐ 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: *Click here to enter text.*

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 jurisidictional. 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.**
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):

☐ 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: *Click here to enter text.*

☐ Other factors. Explain: *Click here to enter text.*

Identify water body and summarize rationale supporting determination: *Click here to enter text.*

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: # linear feet # width (ft).

☐ Other non-wetland waters: # acres.
Identify type(s) of waters: *Click here to enter text.*

☐ 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: *Click here to enter*

text.

☐ Other: (explain, if not covered above): *Click here to enter text.*

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): # linear feet # width (ft).

☐ Lakes/ponds: # acres.

☐ Other non-wetland waters: # acres. List type of aquatic resource: *Click here to enter text..*

☑ Wetlands: 1.72 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): # linear feet # width (ft).

☐ Lakes/ponds: # acres.

☐ Other non-wetland waters: # acres. List type of aquatic resource: *Click here to enter text..*

☐ 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: Submitted request, dated December 9, 2014

☑ 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: *Click here to enter text.*

☐ Corps navigable waters' study: *Click here to enter text.*

☐ U.S. Geological Survey Hydrologic Atlas: *Click here to enter text.*

☐ 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: Anchorage B-8

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS Web Soil Survey

☐ National wetlands inventory map(s). Cite name: *Click here to enter text.*

☐ State/Local wetland inventory map(s): *Click here to enter text.*

☐ FEMA/FIRM maps: *Click here to enter text.*

☐ 100-year Floodplain Elevation is: *Click here to enter text.* (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date): *Click here to enter text.*

☐ or ☑ Other (Name & Date): Applicant provided delineation, dated December 8, 2014

☐ Previous determination(s). File no. and date of response letter: *Click here to enter text.*

☐ Applicable/supporting case law: *Click here to enter text.*

☐ Applicable/supporting scientific literature: *Click here to enter text.*

☐ Other information (please specify): *Click here to enter text.*

B. ADDITIONAL COMMENTS TO SUPPORT JD: *Click here to enter text.*

Blake Romero
Regulatory Specialist

March 4, 2015
Date

Summary Sheet for isolated call based on SWANCC

Corps File Number and Waterway: POA-2014-531
Nearest Town/Village: JBER, Alaska
Proposed Conclusion:
The Corps does not have jurisdictional authority over 8.74 acres of wetlands north of Runway 34/16 on Joint Base Elmendorf-Richardson (JBER). The areas that were reviewed are demarcated in blue and labeled as W1, W2-1, W2-2, W3, and W4 in the attached map, sheet 3 of 7. This map was taken from the applicant's submitted wetland delineation, dated December 8, 2014, completed by Ms. Charlene Johnson, agent for the 673 CES/CEIEC.

Detailed Project Location Site:
The subject wetlands are located within Section 27, T. 14 N., R. 3 W., Seward Meridian, USGS Quad Map Anchorage B-8; at Latitude 61.2713º N., Longitude 149.7946º W.; on JBER, Alaska.

Vegetation:
Based on the wetland delineation datasheets submitted by the agent, the areas identified as exhibiting all three wetland indicators contain the following vegetation: Northern water-plantain (*Alisma trivale*) OBL, fowl blue grass (*Poa palustris*) FAC, leafy tussock sedge (*Carex aquatalis*) OBL, purple marshlocks (*Comarum palustre*) OBL, swollen beaked sedge (*Carex rostrata*) OBL, bluejoint (*Calamagrostis canadensis*) FAC, arctic blue grass (*Poa arctica*) FAC, tall scouring-rush (*Equisetum hyemale*) FACW, unknown sedge (*Carex spp*.), paper birch (*Betula papyrifera*) FACU, speckled alder (*Alnus incana*) FAC, diamond-leaf willow (*Salix pulchra*) FACW, white spruce (*Picea glauca*) FACU, slender wild rye (*Elymus trachycaulus*) FACU, and leatherleaf (*Chamaedaphne calyculata*) FACW.

Adjacent Vegetation:
Based on the wetland delineation datasheets submitted by the agent, the areas identified as lacking one or more of the three wetland indicators contain the following vegetation: Speckled alder (*Alnus incana*) FAC, broad-leaf fireweed (*Chamaenerion latifolium*) FAC, bluejoint (*Calamagrostis canadensis*) FAC, field horsetail (*Equisetum arvense*) FAC, common dandelion (*Taraxacum officnale*) FACU, paper birch (*Betula papyrifera*) FACU, white spruce (*Picea glauca*) FACU, diamond-leaf willow (*Salix pulchra*) FACW, narrow-leaf fireweed (*Chamaenerion angustifolium*) FACU, tall scouring-rush (*Equisetum hyemale*) FACW, prickly rose (*Rosa acicularis*) FACU, slender wild rye (*Elymus trachycaulus*) FACU, and red clover (*Trifolium pretense*) FACU.

Soils/Hydrology:
Based on the applicant's submitted delineation, the areas determined to have all three wetland indicators had the following soils present: 10YR 3/2 "MUCK/Mineral", 10YR 4/2 "sandy loam/gravel", 10YR 4/3 "gravelly/sandy loam", 10YR 3/1 "loamy muck", and 10YR 2/1 "muck, loamy sand".

The areas determined to be wetlands included the following primary wetland hydrology indicators: Surface water, high water table, saturation, water marks, sediment deposits, and drift deposits

The data points that were in areas determined to be wetlands also included the following secondary wetland hydrology indicators: drainage patterns, geomorphic position, and the FAC neutral test.

Soils type and Ksat water transfer calculations were determined by using information from the Natural Resources Conservation Service (NRCS) Web Soil Survey, based on two transects. Transect one begins at the wetland labeled "W4" and extends west to Triangle Lake. Transect two begins in the area of wetlands "W1", "W2-1", "W2-2", and "W3", and extends west to Fish Lake. The two transects consist of the following soil types:

415	Deception-Estelle-Kichatna complex, undulating and steep (Ksat – 0.57 inch/hour low, 1.98 inch/hour high)
446	Salamatof peat (Ksat – 5.95 inch/hour low, 19.98 inch/hour high)

The formula used to find out how long it would take water to transfer between the subject wetland is

- "(distance in feet x 12)/Ksat"

The results of all three calculations for both high and low were added up and the sum was divided by 24 to find the transfer time in days. This number was further divided by 365 to get the water transfer time in years. This calculation was completed for both transects.

Transect one:

415 inch/hour low – (792-feet x 12)/0.57=16,673.68

415 inch/hour high – (792-feet x 12)/1.98=4,800

Results of Ksat calculations for transect one:

Ksat inch/hour low – 16,673/24=694.71/365=1.90 years

Ksat inch/hour high – 4,800/24=200/365=0.55 year

Based on the information provided by the NRCS, the transfer time of water between the wetland labeled as W4 and Triangle Lake along transect one is, on average, approximately 1.22 years.

Transect two:

415 inch/hour low – (1406.5-feet x 12)/0.57=29,610.53

415 inch/hour high – (1406.5-feet x 12)/1.98=8,524.24

446 inch/hour low – (333.3-feet x 12)/5.95=672.20

446 inch/hour high – (333.3-feet x 12)/19.98=200.18

Results of Ksat calculations for transect two:

Ksat inch/hour low – (29,610.53+672.20)/24=1261.78/365=3.45 years

Ksat inch/hour high – (8,524.24+200.18)/24=363.52/365=0.99 year

Based on the information provided by the NRCS, the transfer time of water between the wetlands labeled as W1, W2-1, W2-2, and W3 and Fish Lake along transect two is, on average, approximately 2.22 years.

Adjacent Soils/Adjacent Hydrology:
Based on the applicant's submitted delineation, the areas determined to be lacking one or more wetland indicators had the following soils present: 10YR 3/3 "coarse, gravelly, disturbed", 10YR 3/4 "rocky, disturbed", 10YR 4/2 "coarse gravel till/loam", and 10YR 4/2 "coarse till sandy loam".

The data points that were in areas determined to be located in uplands did not contain any wetland hydrology indicators.

Investigation of Potential Hydrologic Connection:
The Corps' investigation consisted of trying to find a potential surface or shallow subsurface hydrologic connection between the subject wetlands and Fish and Triangle Lakes, both traditionally navigable waterways (TNWs). Both Fish Lake and Triangle Lake are located to the west, relative to the subject wetlands.

The investigation consisted of analysis of two transects because the wetlands labeled as W1, W2-1, W2-2, and W3 are clustered together in close proximity with one another, and W4 is located, at a minimum, approximately ¼-mile away from the cluster.

Based on the geography, topography, and proximity, it was determined that if there was a hydrological connection between the subject wetlands and a TNW, it would be with Fish and Triangle Lakes. After a review of all available data (the applicant's submitted delineation, Corps of Engineers ORM mapping, Fish and Wildlife Service (FWS) online National Wetland Inventory (NWI) mapper, NRCS Web Soil Survey, and Google Earth aerial imagery), it was determined that in addition to there being an upland separation between the subject wetlands and the closest TNWs, there is no potential shallow subsurface connection between the subject wetlands and Knik Arm. As stated above in the soils section, Ksat measurements suggest that the minimum water transfer times are approximately 1.22 and 2.22 years.

Summary:
All available data, including the applicant's December 8, 2014, wetland delineation, appears to suggest that the subject wetlands are geographically, ecologically, and hydrologically isolated from all TNWs and RPWs. The use, degradation, or destruction of the subject wetlands would not affect interstate commerce, and they are not used by interstate of foreign travelers for recreation of other purposes. There are no fish or shellfish present that could be taken and sold in interstate or foreign commerce. The subject wetland is not and could not be used for industrial purposes that would result in interstate commerce.

Prior to the 2001 Supreme Court decision in Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, the wetland areas would have been considered jurisdictional based solely on the "Migratory Bird Rule". Currently, these waters must be considered non-jurisdictional.

Blake Romero
Regulatory Specialist
District Office
Regulatory Division
U.S. Army Corps of Engineers
907-753-2735

Attachments:

Sheet 1 of 7, dated March 4, 2015 – Alaska location area map
Sheet 2 of 7, dated March 4, 2015 – Anchorage location area map
Sheet 3 of 7, dated March 4, 2015 – Delineation area map
Sheet 4 of 7, dated March 4, 2015 – USACE ORM, topography map
Sheet 5 of 7, dated March 4, 2015 – FWS NWI online mapper, wetland map
Sheet 6 of 7, dated March 4, 2015 – NRCS Web Soil Survey, soils map
Sheet 7 of 7, dated March 4, 2015 – NRCS Web Soil Survey, Ksat summary by map unit

POA-2014-531	Fish Lake
673 CES/CEIEC	March 4, 2015

Sheet 1 of 7

POA-2014-531 Fish Lake
673 CES/CEIEC March 4, 2015
Sheet 2 of 7

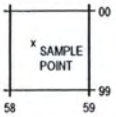
GN
MN

MAGNETIC DECLINATION
17.9°

G-M ANGLE
20.3° (360 MILS)

GRID CONVERGENCE
2° 22' (42 MILS)
FOR CENTER OF SHEET

SAMPLE 1,000 METER GRID SQUARE



100,000 M. SQUARE IDENTIFICATION

UP
UN **00

GRID ZONE DESIGNATION

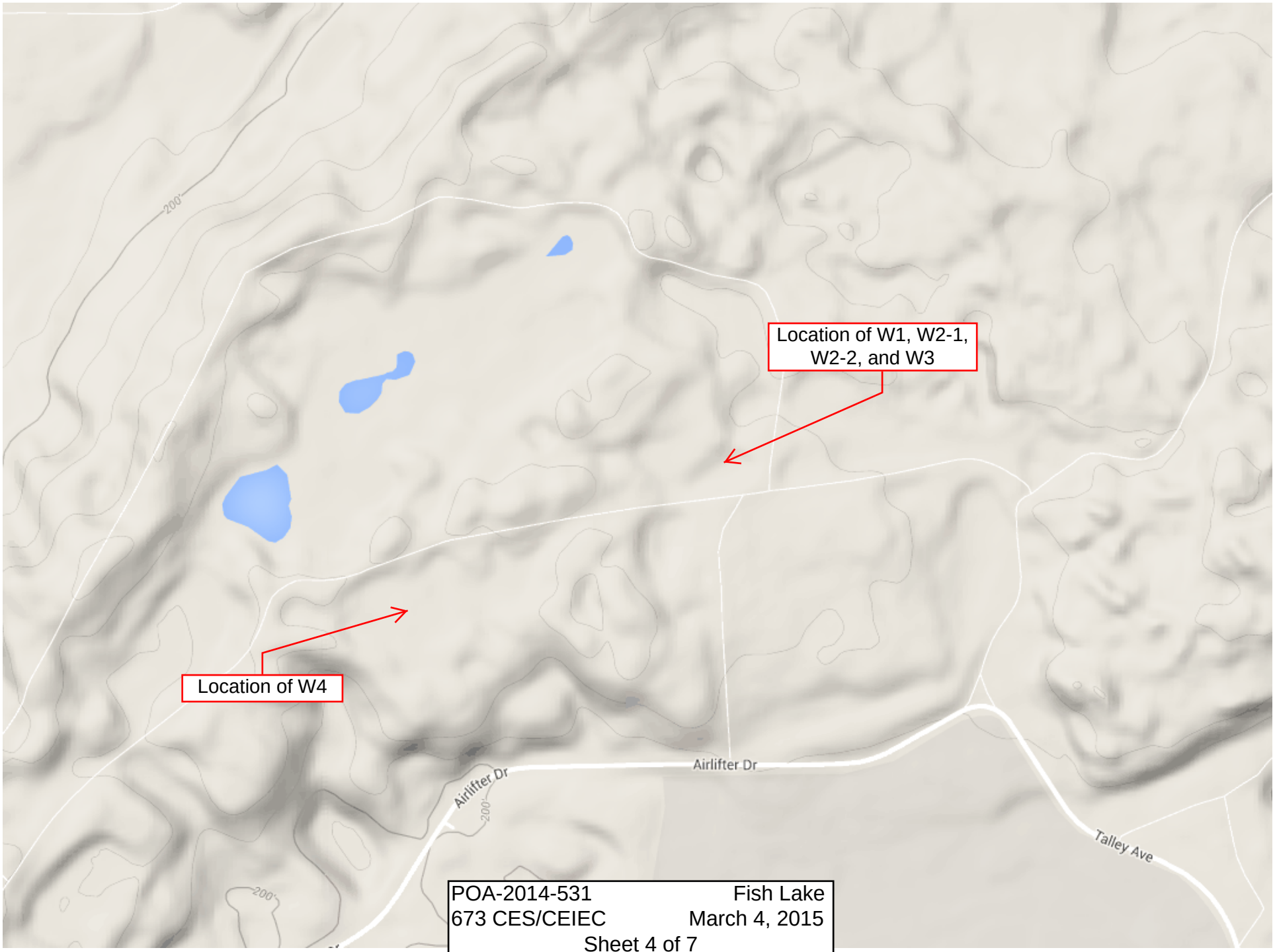
6V

1:10,131

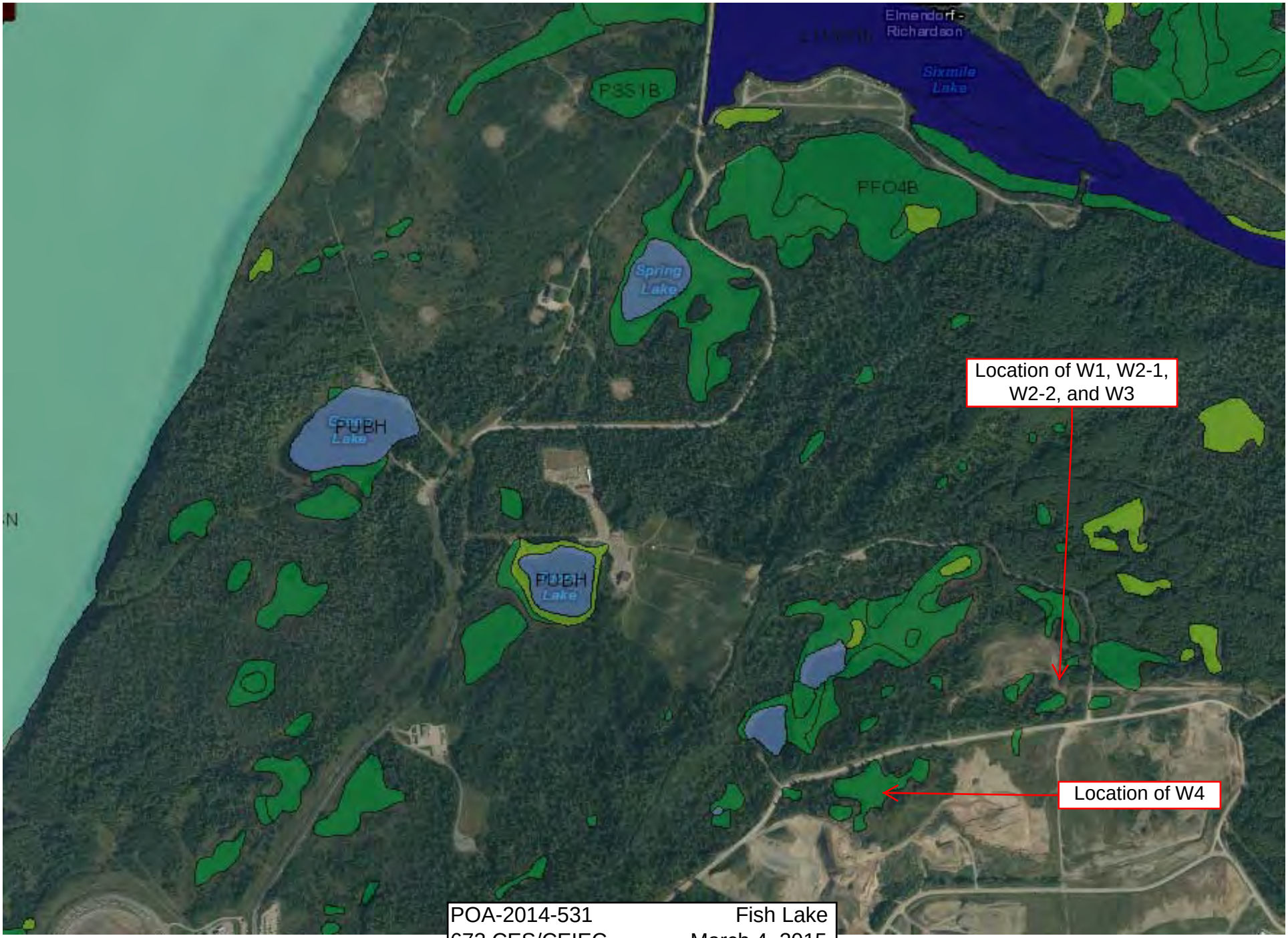
0 50 100 200 300 400 Meters

ELLIPSOID . . . . . WORLD GEODETIC SYSTEM 1984
GRID . . . . . 1000 METER UTM ZONE 6
PROJECTION . . . . . TRANSVERSE MERCATOR
VERTICAL DATUM . . . . . MEAN SEA LEVEL
HORIZONTAL DATUM . . . . WORLD GEODETIC SYSTEM 1984

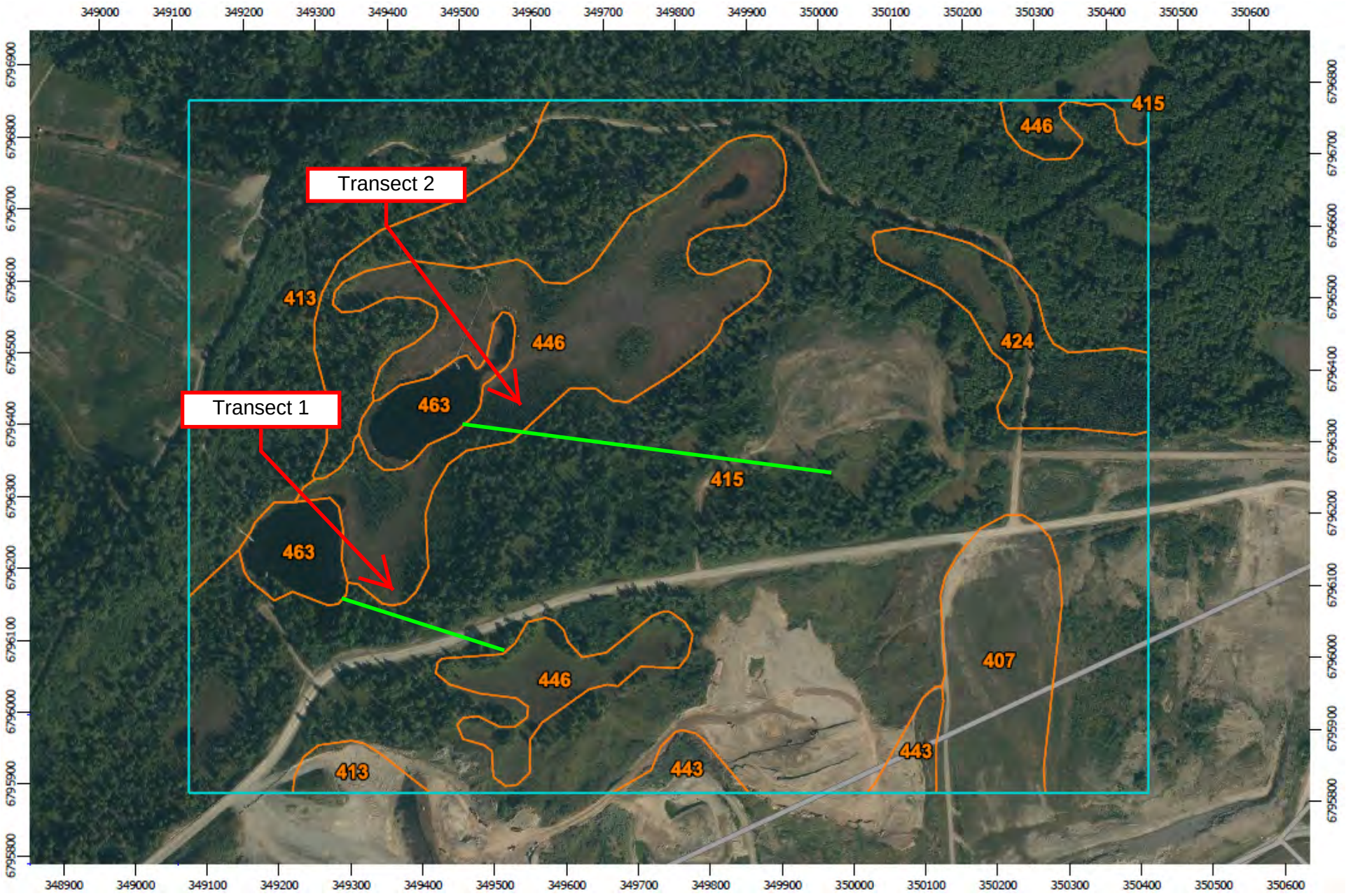
POA-2014-531 Fish Lake
673 CES/CEIEC March 4, 2015
Sheet 3 of 7



POA-2014-531 Fish Lake
673 CES/CEIEC March 4, 2015
Sheet 4 of 7



POA-2014-531 Fish Lake
673 CES/CEIEC March 4, 2015
Sheet 5 of 7



POA-2014-531 Fish Lake
673 CES/CEIEC March 4, 2015
Sheet 6 of 7

Saturated Hydraulic Conductivity (Ksat)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Anchorage Area, Alaska (AK605)				
Map unit symbol	**Map unit name**	**Rating (micrometers per second)**	**Acres in AOI**	**Percent of AOI**
407	Cryorthents and Urban land, 5 to 20 percent slopes	7.7600	13.5	6.3%
413	Deception-Estelle-Kichatna complex, 45 to 85 percent slopes	10.6928	12.4	5.8%
415	Deception-Estelle-Kichatna complex, undulating and steep	10.6928	137.1	63.9%
424	Icknuun peat, 0 to 3 percent slopes	28.0000	6.7	3.1%
443	Pits, gravel		3.2	1.5%
446	Salamatof peat, 0 to 3 percent slopes	90.0000	32.7	15.2%
463	Water, fresh		8.9	4.1%
Totals for Area of Interest			**214.5**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Fastest

Appendix E:
Cultural Resources Survey, SHPO Concurrence Letter

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources
DIVISION OF PARKS
Office of History & Archaeology
550 West 7th Ave., Suite 1310
Anchorage, Alaska 99501-3565
Main: 907.269.8721
E-mail: oha@alaska.net

February 1, 2016

File No.: 3130-1R AIR FORCE / 2016-00004
3330-6N ANC-04238 and 3330-6N ANC-04239

Brent Koenen, GS-13, DAF
Chief, Environmental Conservation
Department of the Air Force
Headquarters, 673D Air Base Wing
Joint Base Elmendorf-Richardson, Alaska

Subject: Runway Expansion Fill Area Archaeological Survey Project Report

Dear Mr. Koenen:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence and accompanying documentation (dated January 5, 2016) on January 6, 2016.

Following our review of the documentation provided, we concur with your determination that sites ANC-04238 and ANC-04239 are **not eligible** for the National Register of Historic Places (NRHP). As such, we concur that a finding of **no historic properties affected** is appropriate for the proposed project, as recommended in the conclusion of the cultural resource inventory report.

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 comment letter does not end the 30-day review period provided to other consulting parties.

Should unidentified 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) or the Alaska Landmarks Register in consultation with our office.

Thank you for the opportunity to comment. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer

JEB:sad

Appendix F:
Road Construction Emissions Model, Calculations and Outputs

Road Construction Emissions Model, Version 7.1.5.1

Emission Estimates for -> N. Runway Hill Removal Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	4.5	24.9	46.2	51.9	1.9	50.0	12.1	1.7	10.4	6,028.6
Grading/Excavation	11.6	58.1	138.4	55.4	5.4	50.0	15.2	4.8	10.4	19,295.7
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	11.6	58.1	138.4	55.4	5.4	50.0	15.2	4.8	10.4	19,295.7
Total (tons/construction project)	0.7	3.6	8.5	2.2	0.3	1.8	0.7	0.3	0.4	1,186.0

Notes:

Project Start Year ->	2017
Project Length (months) ->	6
Total Project Area (acres) ->	105
Maximum Area Disturbed/Day (acres) ->	5
Total Soil Imported/Exported (yd^3/day)->	25000

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> N. Runway Hill Removal Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	2.0	11.3	21.0	23.6	0.9	22.7	5.5	0.8	4.7	2,740.3
Grading/Excavation	5.3	26.4	62.9	25.2	2.5	22.7	6.9	2.2	4.7	8,770.8
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	5.3	26.4	62.9	25.2	2.5	22.7	6.9	2.2	4.7	8,770.8
Total (megagrams/construction project)	0.7	3.3	7.7	2.0	0.3	1.6	0.6	0.3	0.3	1,075.7

Notes:

Project Start Year ->	2017
Project Length (months) ->	6
Total Project Area (hectares) ->	42
Maximum Area Disturbed/Day (hectares) ->	2
Total Soil Imported/Exported ($meters^3$/day)->	19113

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model

Version 7.1.5.1

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	N. Runway Hill Removal	
Construction Start Year	2017	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	6.00	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	1.00	mile
Total Project Area	105.00	acres
Maximum Area Disturbed/Day	5.00	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0.00	yd^3/day
Soil Exported	25000.00	yd^3/day
Average Truck Capacity	40	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing	0.60	0.60
Grading/Excavation	5.40	2.70
Drainage/Utilities/Sub-Grade	0.00	1.80
Paving	0.00	0.90
Totals	6.00	6.00

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	2.00	30
Round trips/day		625
Vehicle miles traveled/day (calculated)		1250

Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**	**PM2.5**	**CO2**
Emission rate (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.40	20.46	1.80	0.43	0.25	4550.00
Tons per contruction period	0.02	1.22	0.11	0.03	0.01	270.27

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	10.00	20
One-way trips/day		2
No. of employees: Grubbing/Land Clearing		5
No. of employees: Grading/Excavation	10.00	18
No. of employees: Drainage/Utilities/Sub-Grade		15
No. of employees: Paving		11

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765
Emission rate - Grading/Excavation (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644
Emission rate - Grading/Excavation (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.039	0.044	0.426	0.010	0.004	99.852
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.003	0.000	0.000	0.659
Pounds per day - Grading/Excavation	0.079	0.089	0.852	0.021	0.009	199.705
Tons per const. Period - Grading/Excavation	0.005	0.005	0.051	0.001	0.001	11.862
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.005	0.006	0.053	0.001	0.001	12.521

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust		1		40
Grading/Excavation - Exhaust		1		40
Drainage/Utilities/Subgrade		1		40

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate - Grading/Excavation (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.01	0.65	0.06	0.01	0.01	145.60
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.96
Pound per day - Grading/Excavation	0.01	0.65	0.06	0.01	0.01	145.60
Tons per const. Period - Grading/Excavation	0.00	0.04	0.00	0.00	0.00	8.65
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		5	50.0	0.3	10.4	0.1
Fugitive Dust - Grading/Excavation		5	50.0	1.5	10.4	0.3
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.71	4.47	9.06	0.35	0.32	825.49
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
2.00	1	Excavators	0.76	5.58	8.10	0.40	0.37	1145.50
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Off-Highway Trucks	1.83	8.58	19.76	0.73	0.67	2834.52
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Rubber Tired Loaders	0.50	3.12	6.05	0.21	0.19	662.79
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	2	Signal Boards	0.64	2.65	2.54	0.17	0.16	314.87
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.71	4.47	9.06	0.35	0.32	825.49
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
2.00	3	Excavators	0.76	5.58	8.10	0.40	0.37	1145.50
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	1.00	3.47	9.64	0.54	0.50	669.23
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
6.00		Off-Highway Trucks	5.50	25.75	59.27	2.20	2.02	8503.56
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.50	3.12	6.05	0.21	0.19	662.79
1.00	2	Scrapers	1.37	7.25	16.41	0.66	0.61	1607.95
	2	Signal Boards	0.64	2.65	2.54	0.17	0.16	314.87
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	2	Tractors/Loaders/Backhoes	0.67	3.14	6.11	0.46	0.42	671.04
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00