Appendix B-Wetlands

Nightmute Airport Improvements
Project #: 51809

WETLAND DELINEATION AND WETLAND FUNCTIONAL ASSESSMENT

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1. INTRODUCTION

The Alaska Department of Transportation and Public Facilities (ADOT&PF), in cooperation with the Federal Aviation Administration (FAA), is developing a project to improve the Nightmute Airport. This report presents the findings of a wetland delineation investigation as a supporting document for the Environmental Assessment (EA) for the proposed Nightmute Airport Improvements. The report describes the delineation process, the types of wetlands found within the project area, functions and values of identified wetlands, and wetland impact as a result of the proposed project.

This report will also be used to request for section 404 permit modification from the U.S. Army Corps of Engineers (USACE). Permit #4-200-0384 - Toksook River 4, was issued on November 7, 2002, by the USACE for impacts to 14.14 acres of wetlands for the proposed Nightmute Airport Improvements project. However, the project footprint has changed. This report reflects the wetland impacts that would result from the current project footprint.

1.1. LOCATION

Nightmute is located on Nelson Island, on the outer fringe of the Yukon-Kuskokwim Delta in western Alaska. It is 18 miles upriver from Toksook Bay and 100 miles west of Bethel. The community lies within Section 33, Township 5N, Range 88W, Seward Meridian, (approximately at Latitude 60.479440° N, and Longitude 164.72389° W). Nightmute is located in the Bethel Recording District (Figure 1: Location and Vicinity Maps).

1.2. PROPOSED PROJECT DESCRIPTION

The Nightmute Airport, which was originally constructed in 1976, does not meet the current FAA design criteria for an A-I [1] Airport classification (ADOT&PF *Nightmute Airport Improvements Draft Environmental Assessment*, March 2003). The community depends on the airport for major transportation and emergency medical evacuations. The current airport condition jeopardizes the safety of users of the airport. The proposed project will:

- Expand the existing 50 ft by 1,600 ft runway to 75 ft by 3,200 ft
- Extend the existing 100 ft by 2,000 ft runway safety area to 150 ft by 3,800 ft
- Provide a 50 ft by 260 ft taxiway on a 79 ft wide safety area.
- Provide a new 150 ft by 255 ft parking apron.
- Provide a 100 ft by 100 ft maintenance and operations pad with two single bay Snow Removal Equipment Buildings.
- Install insulation under the runway extension to prevent permafrost thaw.
- Install a medium intensity lighting system.
- Install a lighted wind cone and segmented circle on a 125 ft by 125 ft pad.

[1] A-I is an Airport Reference Code that designates Nightmute Airport as accommodating aircraft in Design Category A, Group I. Design Category A means the runway is designed for aircraft with a maximum approach speed of less than 91 knots. Group I designates aircraft of a maximum wingspan of less than 49 feet.

- Provide a 30 ft by 60 ft Automated Weather Observation System (AWOS) Pad, two Precision Approach Path Indicator (PAPI) Pads, and install an unlighted wind cone.
- Extend the power line from the village to the airport.
- Rehabilitate the existing 4800 ft by 15 ft airport access road to repair the extreme differential settlement of the road and also to shift the road further away from the Toksook River and realign it within the right of way.
- Provide erosion protection along the airport access road.

1.3. PURPOSE OF THE WETLAND DELINEATION AND FUNCTIONAL ASSESSMENT

The purpose of the wetland delineation and functional assessment is to gather background research and field survey information to effectively identify and define wetland limits and functions; and adequately assess wetland impacts within the project area.

The wetland delineation and functional assessment is limited to the proposed project's Area of Potential Effect (APE). The APE includes the existing and proposed airport property line, Material Site 5 (MS 5), the haul road and the airport access road. (Figure 2: Area of Potential Effect).

2. BACKGROUND INFORMATION

2.1. PHYSICAL ENVIRONMENT BACKGROUND

2.1.1. Historical Land Use

Nightmute is situated on the north bank of the Toksook River on the west side of Nelson Island. Nelson Island has been inhabited by the Qaluyaarmiut, or "dip net people", for 2,000 years. The area was relatively isolated from outside contact, and has maintained its traditions and culture for 2,000 years (Alaska Community Database website accessed 9/2/2005).

2.1.2. Climate

Nightmute is influenced by a marine climate. Precipitation averages 22 inches, with 43 inches of snowfall annually. Summer temperatures range from 41 °F to 57 °F; winter temperatures are 6 °F to 24 °F (Alaska Community Database website accessed 9/2/2005).

2.1.3. Geology and Topography

Nightmute is at sea level, and lies between the base of the 839 feet high Toksook Mountain and the Toksook River that meanders extensively as it flows towards the Etolin Strait. The topography is characterized by expansive areas of near sea level elevation, marsh and shallow lowland lakes with isolated "islands" of bedrock forming low hills. Thick organic deposits (peat and organic silt) are common in some lowland area. Permafrost of the region is characterized as continuous (*Nightmute Airport Improvements Geotechnical Report*, July 2000).

The higher tundra slopes near Toksook Mountain are covered by thick layers of frozen, ice-transported basalt talus and silty colluvium with lobes of freeze-sorted basalt boulders at the surface. The flat terrain along the Toksook River is perennially frozen river deposits of silt and fine sand. The mud sediments are mixed with organic debris and occasional peat beds due to the

tidal nature and meandering course of the river. Sediments in stable areas are covered by thick, live organic mat (*Nightmute Airport Improvements Geotechnical Report*, July 2000).

Material site 5 (MS 5) and a section of the haul road that leads directly into MS 5 are located on the lower slope of the Toksook Mountain. The airport and the airport access road are located on the flat terrain along the Toksook River.

The Nightmute area resides within the boundaries of the Yukon Delta National Wildlife Refuge.

2.2. WETLANDS BACKGROUND INFORMATION

This report describes the wetland delineation process, briefly describes the extent and types of wetlands found in the project area, describes functions and values of the wetlands, and identifies wetlands impacts of the proposed project. Wetlands as referenced in this report are defined as:

Wetlands. 33 Code of Federal Regulations [CFR] Part 328.3(b) defines wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. The USACE *Wetland Delineation Manual* (1987), further outlines that jurisdictional wetlands must meet each of the following three characteristics:

- ***Hydrophytic Vegetation*:** Vegetation community dominated by species that are tolerant of prolonged inundation or soil saturation.
- ***Wetland Hydrology*:** Areas that are periodically inundated or have soils saturated to the surface at some time during the growing season.
- ***Hydric Soils*:** Soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions.

Wetlands are classified as waters of the U.S. (33 CFR Part 328.3(a)). The Toksook River, the flowing waterbody within the project area, is also waters of the U.S.

2.3. BIOLOGICAL ENVIRONMENTAL BACKGROUND

2.3.1. Fish

A September 2005 search of the Alaska Department of Fish & Game (ADF&G) Fish Distribution database reveals the presence of King, Coho, Pink and Chum Salmon and Arctic char in the Toksook River. According to a September 2005 email correspondence with Nancy Ihlenfeldt, Alaska Department of Natural Resources - Office of Habitat Management & Permitting, "the Toksook River is designated as waters important for the spawning, rearing or migration of anadromous fish, as it supports Chinook, Coho, Pink and Chum Salmon, Arctic char and Whitefish."

Local residents acknowledged the presence of black fish in the lake below material site 5 during a November 15, 2004 ADOT&PF project staff visit to Nightmute.

2.3.2. Birds

With a variety of habitat types, Nightmute provides habitat for a number of bird species. The abundance of water in the area (river, lakes, ponds and muskegs) provides important habitat for waterbirds. Several birds use the area for nesting, roosting and feeding. Several nest and eggs were found during a June 2000 site visit by ADOT&PF staff. Birds observed nesting include Pacific Loon (nest with 2 eggs); Short-billed Dowitcher (nest with 4 eggs); Greater White-fronted Goose (nest with 2 eggs); Red-throated Loon (nest with 2 eggs); and Red-necked Phalarope (nest with 3 eggs). A list of birds potentially found in the Nightmute area is in Appendix B.

2.3.3. Threatened and Endangered Species

There are no threatened and endangered species in the project area according to the US Fish and Wildlife Service (USF&WS) (Ann G. Rappoport, USF&WS, 01/17/2002). A field trip was conducted with personnel from USF&WS and ADOT&PF on June 14, 2000 for the purpose of evaluating the presence of Threatened and Endangered Species in Nightmute. No Spectacled or Steller's eiders nests were found as was initially expected to be present because Nightmute is within the historic range of spectacled eider (*somateria fisheri*) and steller's eider (*Polysticta stelleri*). No Spectacled or Steller's eider, or Bald Eagle nests have been observed in the project area.

2.3.4. Mammal

A variety of animals including moose, musk ox, river otter, arctic fox, red fox, weasel species, arctic ground squirrel, arctic hare, lemming species, beaver, muskrat, and mink may be present in the Nightmute area (Ann G. Rappoport, USF&WS, 04/19/2000).

3. METHODS

Wetland types were mapped and evaluated to assess the impact of the proposed project on wetlands. Wetland delineation was carried out using best professional judgement, and the USACE routine method that combines offsite and onsite assessment as outlined in the *USACE Wetland Delineation Manual* (1987). Wetland mapping was completed using multiple steps that include the use of aerial photo, AutoCAD line drawings, field derived notes, wetlands data forms, site photographs and existing resource information such as the project geotechnical report and other research efforts.

ADOT&PF personnel visited the project site for detailed investigation of the project area on July 11, 2005. Several photographs and a few soil pits were dug for soil analysis. A second site visit was conducted on August 8, 2005, for a more thorough vegetation cover analysis and to gather additional information to complete the wetland delineation and functional assessment. Characteristic wetlands and upland areas were studied during site visits in accordance with the three parameter method of determining wetlands outlined in the *USACE Wetland Delineation Manual* (1987). The premise of the triple parameter approach is that the three essential characteristics of wetlands (hydrophytic vegetation, hydric soils, and wetland hydrology) must all be present to have a positive wetland determination.

This report includes photographs and data gathered during the July and August 2005 site inspections.

3.1. BACKGROUND RESEARCH

Background research consisted of review of published and unpublished information regarding Nightmute, Nelson Island and the Toksook River. Sources of documented environmental resources include, but are not limited to:

- The Alaska Department of Fish & Game Online Fish Distribution Database
- Nightmute Airport Improvements Draft Environmental Assessment

The online National Wetlands Inventory (NWI) was consulted, however, no NWI mapping exist for Nightmute. A full list of cited references is presented at the end of this report.

3.2. FIELD INVESTIGATION AND DATA COLLECTION

The filed survey was conducted by walking the area, taking photographs, digging soil pits and analyzing vegetation cover within a 30-foot radius from soil pits or a set reference point where pits where not dug due to inundation or hard rocky soils. Reference points or sampling locations for hydrology, soils and vegetation cover analysis were determined by changes in vegetation community. Vegetation percent cover was visually estimated at all reference/sampling points. Samples of dominant vegetation that were not easily determined on site were collected and taken to the office for thorough vegetation species identification using several botanical references listed in section 3.3.1.

3.3. DATA ANALYSIS

The following describes the method of analysis for each wetland component (vegetation, hydrology and soils).

3.3.1. Vegetation

In order to determine the presence of hydrophytic vegetation at each reference/sampling location, percent cover of dominant plant species belonging to each stratum (tree, shrub and herb) were visually estimated. Dominant species are those having the greatest relative basal area (woody overstory), greatest height (woody understory), greatest percent of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). The *USACE Wetland Delineation Manual* (1987) defines the strata as:

- ***Tree stratum:*** woody plants greater than 3.0 inches diameter at breast height (dbh) regardless of plant height (exclusive of woody vines).
- ***Shrub stratum:*** Layer of vegetation composed of woody plants less than 3.0 inches dbh but greater than 3.2 feet tall (exclusive of woody vines).
- ***Herb stratum:*** includes all non-woody plants and woody plants (including vines) that are less than 3.2 feet tall. This definition includes all low shrubs such as dwarf birch, alder and labrador tea within the project area in the herbaceous layer. Throughout this report, all shrubs less than 3.2 feet tall are referred to as herbaceous (low shrub) plants.

Plant species that were difficult to identify onsite, were identified at the office using plant samples collected onsite and the following botanical books: *Flora of Alaska and Neighboring Territories* (Hulten E., 2000); *Plants of the Western Boreal Forest & Aspen Parkland* (Johnson Derek et al., 1995); *Field Guide to Alaskan Wildflowers* (Pratt Verna, 1999); and *Alaska Trees and Shrubs* (Viereck Leslie and Little Elbert, 1992). *The National List of Plant Species that Occur in Wetlands: Alaska (Region A)* was used to determine each plant's wetland indicator status. Table 1 shows the vegetative status indicator categories adapted from the *USACE Wetland Delineation Manual* (1987).

Table 1: Vegetative Status Indicator Categories

Categories	Symbols	Likelihood of occurring in wetlands	Description
Obligate Wetland	OBL	>99% (1% in non-wetlands)	Occurs almost always under natural conditions in wetlands
Facultative Wetland	FACW	>67% to 99% (1 to 33% in non-wetlands)	Usually occurs in wetlands, but also occur in non-wetlands
Facultative	FAC	33% to 67%	Equally likely to occur in wetlands or non-wetlands
Facultative Upland	FACU	1% to 33% (67 to 99% in non-wetlands)	Usually occurs in non-wetlands, but occasionally found in wetlands
Obligate Upland	UPL	<1% (>99% in non-wetalnds)	Rarely occurs in wetlands but occurs almost always in non-wetlands under natural condition.

Plant dominance was determined by the "50/20" rule and the prevalence index calculation (Appendix D).

The "50/20 rule" determines plant dominance for each stratum, by listing plants species and their approximate percent coverage in their descending order of abundance until a cumulative total of fifty percent (50%) is reached. These species and any additional species with a percent cover equaling twenty percent (20%) or more are recorded as dominant. The wetland indicator status of each dominant species is recorded. If majority of the dominant species is facultative (FAC) or wetter, the vegetation is determined to be hydrophytic.

For the prevalence index, a numeric value is derived from mathematical calculations of the percent absolute values of plants grouped by their indicator status (OBL, FACW, FAC, FACU, and UPL). A value of 3 or less indicates the presence of hydrophytic vegetation. The formula for the prevalence index is:

$$\frac{OBL+2(FACW)+3(FAC)+4(FACU)+5(UPL)}{OBL+FACW+FAC+FACU+UPL}$$

Prevalence index calculation was not performed for vegetation communities where obligate vegetation were thriving. Hydrophytic vegetation determination can be reached for any vegetation community where obligate vegetation are dominant.

3.3.2. Hydrology

Primary and secondary wetland hydrology indicators such as inundation, the presence of water in test holes or saturation in upper 12 inches of soil, oxidized root channels in upper 12 inches of soil, were recorded on routine wetland determination data forms (Appendix C).

3.3.3. Soils

Soil was excavated by shovel to a depth of 16 inches at each reference point, in areas where excavation was possible. Plant roots, large rocks and gravel prevented deeper excavation at several locations. Soil pits were not dug at waterlogged reference points where obligate hydrophytic vegetation were dominant. The 2000 *Munsell Soil Color Charts* was used to determine the hue, value and chroma of soils.
Hue: indicates a color's relation to red, yellow, green, blue, and purple.
Value: indicates a color's lightness.
Chroma: indicates a color's strength or departure from a neutral of the same lightness.

3.4. Map Compilation and Wetland Impact Determination

Wetland mapping was completed in the office using aerial photograph, AutoCAD drawings, field observation notes, vegetation cover analysis, hydrology and hydric soil determination. Wetland types were classified using the *Classification of Wetlands and Deepwater Habitats of the United State* by Lewis Cowardin et al (1979). Mapping was completed for all areas within the project footprint - access road, the proposed haul road, material site # 5, and the runway (Figures 3A & 3B). Areas of soil excavation (soil pits) were mapped on Figures 3A-2 & 3B-2.

Wetland impact was calculated by measuring identified wetlands within the project footprint.

3.5. Wetland Functions and Values[1]

The functions and values of the wetlands were assessed using best professional judgement, and guidelines from the USACE and the US Department of Transportation (USDOT) *Wetland Evaluation Technique* (WET) Volume II (1987), and the Washington State Department of Transportation (WSDOT) *Wetland Functions Characterization Tool for Linear Projects.*

WET assesses the values and functions of wetlands in terms of social significance, effectiveness and opportunity. Social significance evaluates the value of a wetland to society due to its special designations, potential economic value, and strategic location. Effectiveness determines the capability of a wetland to perform a function due to its physical, chemical or biological characteristics. Opportunity assesses the opportunity of the wetland to perform a function to its level of capability.

The wetlands' hydrological, water quality, ecological functions, and social values were ranked as low, medium or high depending on the wetlands' capability to provide such functions or values.

[1] Wetland functions are the physical, chemical and biological characteristics of a wetland. Wetland values are those characteristics that are beneficial to society.

Hydrological functions were determined from the topographic relation of the wetland and the presence of vegetation that could impede the movement of water by dissipating flood water energy or reducing the erosive force of surface water.

Water quality functions were determined based on the wetlands' ability to remove sediments, nutrients and toxic contaminants from water.

The ecological functions of the wetlands were defined based on observation of the wetland's topographic positions, hydrologic dynamics, vegetation types and signs of animals.

Social values such as educational, scientific and archeological values where based on existing research findings.

Wetland functional assessment data forms used in the field were designed from the WSDOT Wetland Field Data Forms and information gathered from the USACE and USDOT WET. Functional Assessment forms are in Appendix E.

4. RESULTS AND DISCUSSIONS

The result of the wetland determination includes discussion of both wetlands and uplands (non-wetlands) found within the project area. Wetlands were classified according to the *Classification of Wetlands and Deepwater Habitats of the United State* by Lewis Cowardin et al (1979) and the NWI codes. The most common wetland type within the project area, is the Palustrine Emergent Persistent (PEM/1) wetland. The NWI codes used in this report are Palustrine (P), Emergent (EM), Persistent Vegetation (1), and Non-Tidal Water Regime as B for Saturated, and E for Seasonally Flooded/Saturated. The wetlands and uplands identified within the project footprint are represented on Figures 3A & 3B.

Results of the wetland determination are presented below under each sampling /reference location. The results of the functional assessment were presented under each Cowardin Wetland Class.

4.1. RUNWAY WEST[1]: PALUSTRINE EMERGENT (PEM1/E) SEDGE/MOSS WETLAND

Photo taken on 8/8/05

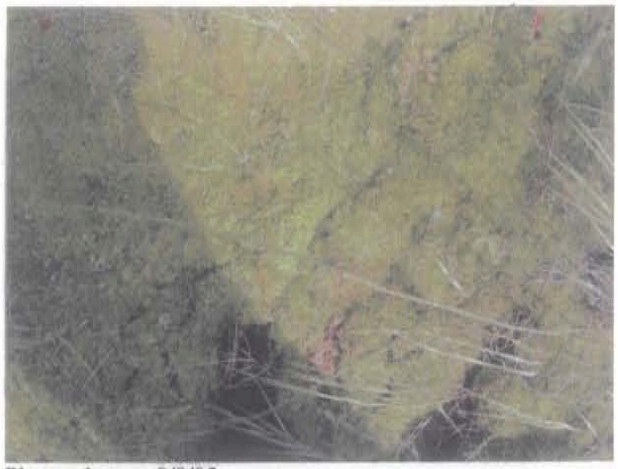

Photo taken on 8/8/05

Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge/Moss. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. Certain areas were heavily carpeted with thick spongy moss *(Sphagnum Spp)*. Marsh five-finger (*Potentila Palustris*) was sparely distributed throughout the sedge/moss wetland. There were few dead shrubs in the area. Thinleaf alder (*Alnus Tenuifolia*) lined the edges of the disturbed section of the runway.

Genus/Species	Common Name	Family	Wetland Indicator Status[2]
Eriophorum Scheucheri	Cotton grass	Sedge	OBL
Potentilla Palustris	Marsh Fivefinger	Rose	OBL
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Sphagum spp	Peat moss	Moss	-

The dominant plant species are obligate (OBL), therefore the vegetation is hydrophytic. This determination is based on the obvious dominance of obligate plant species along the west side of the proposed runway.

The area was inundated and appears to stay flooded throughout the growing season, until freeze up. Inundation is a primary wetland hydrology indicator, therefore wetland hydrology exist. Data forms for routine wetland determination are in Appendix C.

[1] The "Runway West" is the west side of the existing runway within the proposed project footprint.

[2] - indicates that the wetland indicator status was not available in the USF&WS *National List of Plant Species That Occur in Wetlands: Alaska (Region A).*

Soil pits were not dug due to inundation. The soil is determined to be hydric due to evidential thriving of obligate vegetation in the area.

4.2. RUNWAY EAST[1]: PALUSTRINE EMERGENT (PEM1/E) SEDGE/MOSS WETLAND

Photo taken on 8/8/05

Photo taken on 8/8/05

Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge/Moss. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. Certain areas were covered with peat moss *(Sphagnum Spp).* Horsetail *(Equisetum hiemale)* were localized in one area and sporadically present throughout the wetland area. Marsh five-finger *(potentila Palustris)* was sparely distributed throughout the sedge/moss wetland. There were several dead shrubs in the area and thinleaf alder (*Alnus Tenuifolia*) lined the edges of the disturbed section of the runway.

Genus/Species	Common Name	Family	Wetland Indicator Status[2]
Eriophorum Scheucheri	Cotton Grass	Sedge	OBL
Potentilla Palustris	Marsh Five-finger	Rose	OBL
Equisetum Hiemale	Horsetail	Horsetail	FACW
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Sphagum spp	Peat Moss	Moss	-

The vegetation and hydrology of the east side of the runway were similar to the west side discussed above except for the presence of dead shrubs, and localized Horsetail *(Equisetum hiemale)* in certain areas. Areas of standing water were visible throughout this section of the runway. Wetland hydrology and hydric soils are determined present.

[1] The "Runway East" is the east side of the existing runway within the proposed project footprint.

[2] - indicates that the wetland indicator status was not available in the USF&WS *National List of Plant Species That Occur in Wetlands: Alaska (Region A).*

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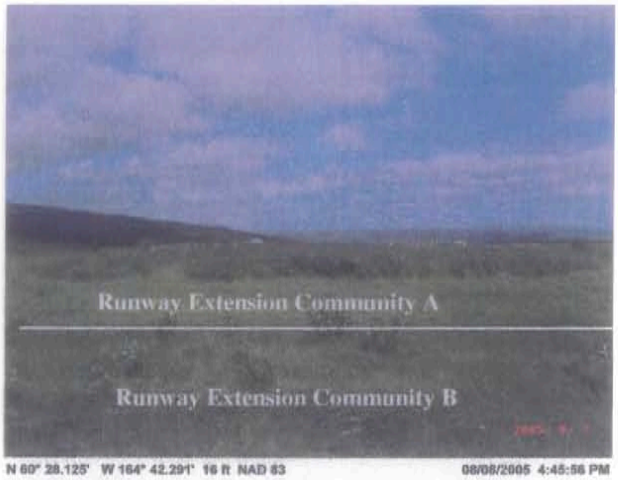
Soil pits were not dug due to inundation. The soil is determined to be hydric due to obvious thriving of obligate vegetation in the area.

4.3. Runway Extension community A[1]: Palustrine emergent (PEM1/E) sedge/moss wetland

The vegetation and hydrology were also similar to those of the west side of the runway as discussed above. Thinleaf alder (*Alnus Tenuifolia*) lined the toe of the runway extension.

Runway Extension Community A



Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge/Moss. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. The area was covered with peat moss *(Sphagnum Spp)*.

Genus/Species	Common Name	Family	Wetland Indicator Status[2]
Eriophorum Scheucheri	Cotton Grass	Sedge	OBL
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Potentilla Palustris	Marsh Five-finger	Rose	OBL
Sphagum spp	Peat Moss	Moss	-

The prevalence index for this vegetation community is 1.13, confirming the presence of hydrophytic vegetation. The soil is hydric and wetland hydrology exist.

[1] The "Runway Extension Community A" is the total area extending 58 feet from the southwest toe of the existing runway. This reference point was separated from runway extension community B because the hydrology and vegetation community changed slightly after the 58ft waterlogged area.

[2] - indicates that the wetland indicator status was not available in the USF&WS *National List of Plant Species That Occur in Wetlands: Alaska (Region A).*

4.4. RUNWAY EXTENSION COMMUNITY B[1]: PALUSTRINE EMERGENT (PEM1/B) HEATH/BIRCH WETLAND

This section of the runway extension also contains Palustrine Open Water (POW) wetlands. Although the POW (4 ponds) are within the project footprint, they will not be directly impacted by the project because they are outside the fill limits (Figure 3A).

The vegetation of the Palustrine emergent (PEM1/B) Heath/Birch wetland consists of cotton grass and herbaceous (low shrub) dwarf birch, alder, lingoberry, and labrador tea.

Photo taken on 8/8/05

Photo taken on 8/8/05

Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Saturated; Water Chemistry: Fresh; Dominance Type: Heath/Birch. Lingoberry *(Vaccinium Vitis-idaea)* is the dominant plant.

Genus/Species	Common Name	Family	Wetland Indicator Status
Vaccinium Vitis-idaea	Lingoberry	Heath	FAC
Betula Nana	Dwarf Birch	Birch	FAC
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Ledum L.	Labrador Tea	Heath	FACW
Eriophorum Scheucheri	Cotton grass	Sedge	OBL

Based on the dominance of vegetation species with a wetland indicator status of FAC or wetter, the vegetation is determined to be hydrophytic. The prevalence index for this vegetation community is 2.43, confirming the presence of hydrophytic vegetation. The prevalence index of 2.43 indicates a difference from the vegetation of runway extension community A, which had a prevalence index of 1.13, signifying thriving of hydrophytic vegetation than community B.

[1] The Runway Extension Community B extends from the end of community A to the end of the proposed runway extension.

The soil test pit revealed about 10 inches of saturated organic silty soil topped with light brown fibrous damp organic layer. This confirms the presence of hydric soil.

The soil was saturated to the surface and water was observed in the soil pit at about 6 inches, indicating primary wetland hydrology.

4.5. New Apron: Palustrine Open water (POW) and Palustrine emergent (PEM1/E)

The area for the new apron consists of a small pond (120 ft by 160 ft) and wet tundra. The area outside the pond had emergent vegetation. This proposed apron is determined to have two types of wetlands: Palustrine Open Water (POW)/unknown bottom, and Palustrine Emergent (PEM1/E) wetlands.


Photo taken on 8/8/05


Photo taken on 8/8/05

Classification: System: Palustrine; Class 1 (lake): Open Water/unknown Bottom; Subclass: Persistent; Water Regime: Permanently Flooded; Water Chemistry: Fresh; Dominance Type: grass is the dominant plant. Class 2 (wet tundra): Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. The vegetation in the wet tundra is similar to those of the airport access road described below.

4.6. AIRPORT ACCESS ROAD: PALUSTRINE EMERGENT (PEM1/E) SEDGE WETLAND

Photo taken on 8/8/05

Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. Subordinator plants include marsh five-finger (*Potentilla Palustris*), bluejoint grass (*Calamagrostis Canadensis*), Crowberry (*Empetrum Nigrum*), and peat moss (*Sphagum spp*). A dense growth of alder (*Alnus Tenuifolia*) lined the disturbed section of the access road.

Genus/Species	Common Name	Family	Wetland Indicator Status
Eriophorum Scheucheri	Cotton Grass	Sedge	OBL
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Calamagrostis Canadensis	Bluejoint Grass	Grass	FAC
Empetrum Nigrum	Crowberry	Heath	FAC
Potentilla Palustris	Marsh Five-finger	Rose	OBL
Sphagum spp	Peat Moss	Moss	-

The area was inundated. Wetland hydrology, hydrophytic vegetation and hydric soils are determined present.

4.7. HAUL ROAD COMMUNITY A[1]: UPLAND (NON-WETLAND)

This is a disturbed section of the haul road close to an existing material site near town. The area was extremely difficult to dig due to hard dry soil and large rocks and gravels.

Photo taken on 8/8/05

Photo taken on 8/8/05

Genus/Species	Common Name	Family	Wetland Indicator Status[2]
Betula Nana	Dwarf Birch	Birch	FAC
Equisetum Spp	Horsetail	Horsetail	-
Epilobium Angustifolium	Fireweed	Evening Primrose	FACU
Agrostis Spp	Grass	Grass	FAC
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Empetrum nigrum	Crowberry	Heath	FAC

No evidence of wetland hydrology was observed during field investigation. Hydric soils and wetland hydrology were not present. The prevalence index for this vegetation community is 3.15, indicating that the vegetation community is not hydrophytic. The area is determined to be upland (non-wetland).

[1] The haul road community A is the beginning of the haul road close to the Nightmute community.

[2] - indicates that the wetland indicator status was not available in the USF&WS *National List of Plant Species That Occur in Wetlands: Alaska (Region A).*

4.8. HAUL ROAD COMMUNITY B[1]: PALUSTRINE EMERGENT (PEM1/B) GRASS/BIRCH WETLAND

Photo taken on 8/8/05

Photo taken on 8/8/05

Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Saturated; Water Chemistry: Fresh; Dominance Type: Grass. Dwarf birch were more on the upper rocky side of the wetland.

Genus/Species	Common Name	Family	Wetland Indicator Status
Calamagrostis Canadensis	Bluejoint Grass	Grass	FAC
Arctophilia Fulva	Pendent Grass	Grass	OBL
Betula Nana	Dwarf Birch	Birch	FAC
Empetrum Nigrum	Crowberry	Heath	FAC
Vaccinium Caespitosum	Dwarf Blueberry	Heath	FACW
Agrostis Spp	Grass	Grass	FAC
Petasites Hyperboreus	Colts Foot	Composite	-
Salix Reticulata L.	Netleaf Willow	Willow	FAC

[1] The haul road community B is the wetland section of the haul road where the vegetation community changes from community A (upland) and progresses into a saturated wetland.

R-18

Soil:

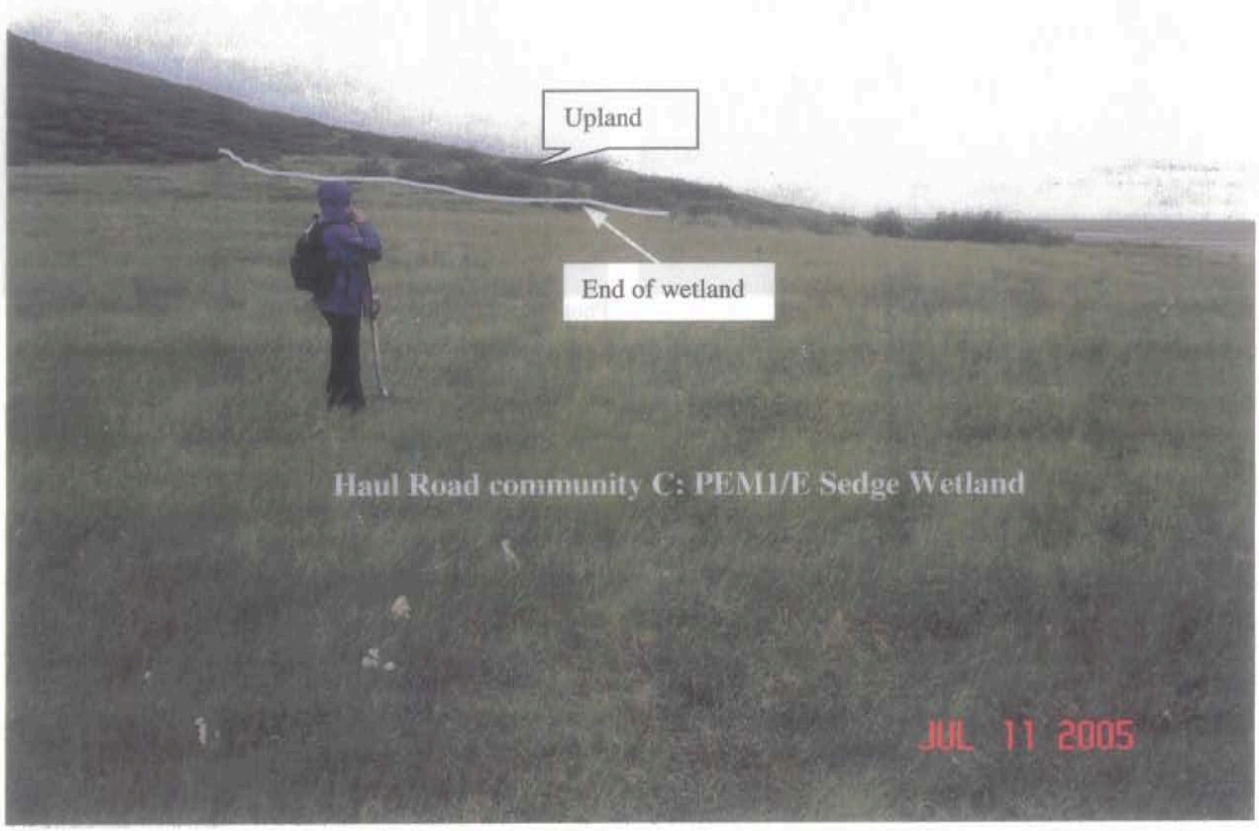
Photo taken on 8/8/05

Photo taken on 8/8/05

Redoximorphic features were observed at about 7 inches from the surface. Gley 1 5/10Y with about an inch strip of 5YR 4/6. Water did not accumulate in the soil pit, however, a few drops of water was squeezed out of the soil, indicating saturation. Oxidized root channels is indicative of secondary wetland hydrology.

The soil is hydric and wetland hydrology exists. Based on the dominance of vegetation species with a wetland indicator status of FAC or wetter, the vegetation is determined to be hydrophytic.

4.9. HAUL ROAD COMMUNITY C[1]: PALUSTRINE EMERGENT (PEM1/E) SEDGE WETLAND



Classification: System: Palustrine; Class: Emergent; Subclass: Persistent; Water Regime: Seasonally Flooded; Water Chemistry: Fresh; Dominance Type: Sedge. Cotton grass *(Eriophorum Scheuchzeri)* is the dominant plant. Subordinator plants include pendent grass (arctophilia fulva), marsh five-finger (*Potentilla Palustris*), bluejoint grass (*Calamagrostis Canadensis*), crowberry (*Empetrum Nigrum*), and peat moss (*Sphagum spp*).

[1] This is the section of the haul road that begins at the end of haul road community B and ends at the dense shrub upland shown in the above photo.

Photo taken on 8/8/05

Photo taken on 8/8/05

The area was inundated and some areas were covered with peat moss. The dominance of cotton grass increases to almost 80% as community C progresses further away from community B.

Genus/Species	Common Name	Family	Wetland Indicator Status
Eriophorum Scheucheri	Cotton grass	Sedge	OBL
Arctophilia Fulva	Pendent Grass	Grass	OBL
Calamagrostis Canadensis	Bluejoint Grass	Grass	FAC
Empetrum Nigrum	Crowberry	Heath	FAC
Potentilla Palustris	Marsh Five-finger	Rose	OBL
Sphagum spp	Peat moss	Moss	-

Wetland hydrology exists. Hydrophytic vegetation and hydric soils are determined to be present.

4.10. HAUL ROAD COMMUNITY D[1]: UPLAND

The vegetation consists of dense growth of alder (*Alnus Tenuifolia*), with open areas of fireweed (*Epilobium Angustifolium*), crowberry (*Empetrum nigrum*) and grass (*Agrostis Spp*). Arctic Raspberry (*Rubus arcticus*) were found under the dense cover of the alder shrub.

[1] This is the section of the haul road after the haul road community C and it leads into material site # 5.


Photo taken on 8/8/05


Photo taken on 8/8/05

Classification: This area is classified as Alder thicket. Thinleaf alder and fireweed dominate the vegetation in this area.

Genus/Species	Common Name	Family	Wetland Indicator Status
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Epilobium Angustifolium	Fireweed	Evening Primrose	FACU
Empetrum nigrum	Crowberry	Heath	FAC
Arctagrotis Latifolia	Grass	Grass	FaCW
Agrostis Spp	Grass	Grass	FAC
Rubus arcticus	Arctic Raspberry	Rose	FAC
Equisetum Silvaticum	Horsetail	Horsetail	FACU
Betula Nana	Dwarf Birch	Birch	FAC

Soil pits were extremely difficult to dig due to roots and rocks almost at the surface. The soil was damp but not saturated. It forms a ball on the palm when squeezed but no free drops of water. No evidence of primary or secondary wetland hydrology were observed.

The 50/20 rule indicates the presence of hydrophytic vegetation, however, a prevalence index of 3.13 was obtained, showing that the vegetation community is not hydrophytic. With the USACE triple parameter approach the three essential characteristics of wetlands (hydrophytic vegetation, hydric soils, and wetland hydrology) must all be present to have a positive wetland determination. The haul road community D is determined to be upland (non-wetland).

4.11. Material Site #5: Upland

Material site #5 is at the lower slope of the Toksook Mountain. The vegetation is similar to those of the haul road community D.

R-72

Classification: This area is classified as Alder thicket with open areas of grass (*agrostis Spp*). Thinleaf alder and fireweed dominate the vegetation in this area.

Genus/Species	Common Name	Family	Wetland Indicator Status
Alnus Tenuifolia	Thinleaf Alder	Birch	FAC
Epilobium Angustifolium	Fireweed	Evening Primrose	FACU
Arctagrotis Latifolia	Grass	Grass	FaCW
Agrostis Spp	Grass	Grass	FAC

No wetland hydrology indicators were observed. The soil consists of gravelly silt with cobbles and boulders. The prevalence index for this vegetation community is 3.17, indicating that the vegetation community is not hydrophytic. This area is determined to be upland.

4.12. FUNCTIONAL ASSESSMENT FOR THE PALUSTRINE EMERGENT WETLANDS

For simplicity of result presentation, the palustrine open water wetlands found within the project footprint were grouped with the palustrine emergent wetlands.

4.12.1. Hydrological Functions

Flow alteration, erosion control and shoreline stabilization functions are determined to be very low because the wetlands lack dense woody vegetation except for the edges of disturbed sections of the runway and the access road that are lined with alder shrubs. There are no energy absorbing vegetation bordering the watercourse to prevent erosion. The wetland does not currently provide erosion control and shoreline stabilization functions. There was evidence of severe bank erosion at some sections of the airport access road. The proposed project will provide erosion protection to the airport access road.

These wetlands may provide storage capacity for floodwater due to the presence of dense organic mats in some areas, however, the area of impact as a result of the project is so small that the project will not affect the surrounding wetlands ability to perform this function. Due to lack of woody vegetation, the emergent wetland's potential to attenuate the severity of peak flows by dissipating energy during flooding, are extremely low.

4.12.2. Water Quality Functions

The areas of dense herbaceous vegetation within the palustrine emergent wetlands have the potential to provide water quality or biofiltration functions by removal of sediments, nutrients and toxicants. The opportunity to provide such water quality functions is low. Currently, there are no sewage outfalls or any other nutrient rich sources within the project area or within surrounding wetlands. The opportunity to provide this function may be high in the future because a waste stabilization pond with an annual discharge of treated wastewater (sewage) is planned for construction sometime in the future.

The opportunity for sediment removal is also very low. Sources of excess sediments (from tillage or construction) that could provide the opportunity for sediment removal are not present.

4.12.3. Ecological Functions

The emergent and open water wetlands' functions of providing suitable habitat for aquatic invertebrates and wetland-associated birds are very high. The important features of these wetlands are the presence of reliable food (especially from the heath family of plants), emergent vegetation, inundation and open water (ponds). Several birds have been observed breeding and nesting in the area. A list of birds potentially found in the Nightmute area is included in Appendix B.

The function of providing habitat for mammals is considered moderate (ranks as medium). Vegetation is a very important component of wildlife habitat. The potential for animal diversity increases as the plant community diversity increases. The emergent wetland lacks diversity of vegetation. The vegetation does not provide enough cover for animals and the wetlands are located very close to highly disturbed areas (runway and airport access road). Except for a beaver dam observed at the far end of the pond below MS 5, no dens, animal tracks, or droppings were observed during field work. The nearness of the Toksook river and the connectivity of the wetlands with the shrub thicket at the slope of the Toksook mountain, are positive ecological elements.

Since the wetlands and ponds freeze completely during the winter, it does not provide suitable habitat for fish. No fish was observed during fieldwork. The function of providing habitat for fish is very low.

4.12.4. Educational and Scientific Values

The wetlands within the project area are not likely to provide educational and scientific values to the community. There are no documented scientific or educational uses. The biological and ecological features of the wetlands are not unique.

4.12.5. Cultural and Social Significance

Some sections of the airport access road have high degree of social significance due to the presence of an archeological site. A Cultural Resource Survey of the APE conducted by the Alaska Department of Natural Resources - Office of History and Archaeology (OHA) in March 2005, recorded an archaeological site previously identified by the Bureau of Indian Affairs as a possible village site (*Cultural Resource Survey of the Proposed Nightmute Airport*

Improvements, Material Site, and Haul Road Report by Alan DePew and Will Schneider, (2005)). The value of the wetlands could be high because of cultural and archeological significance.

5. WETLAND IMPACTS

Impacts of the proposed project on wetlands are presented below. The no-build alternative will have no impact on wetlands because the airport will be left as it is.

The proposed airport improvement areas, airport access road, haul road and material sites will impact approximately 19 acres of wetlands. This includes the palustrine open water wetland (pond) at the proposed apron. The POW at the proposed apron is approximately 0.37 acres. This is within the fill limit of the project and would be directly impacted by the proposed project. All other POWs within the project footprint will not be directly impacted by the project and are not included in the wetland impact calculations.

No impact to the Toksook river is anticipated. An Erosion and Sediment Control plan will be developed, and the contractor will be required to prepare and maintain a Storm Water Pollution Prevention Plan before construction.

Estimated acres of wetlands and open water impacted are presented in Table 2.

Table 2: Wetland and Waterbody Impacts

	Acres of wetland impacted					
Description	**Runway**	**Apron & Taxi**	**Access Road**	**Haul Road**	**Material Site 5**	**Total**
Palustrine Emergent Wetlands	14.80	1.61	2.04	0.17	0	18.62
Palustrine Open Water	0	0.37	0	0	0	0.37
Total	14.80	1.98	2.04	0.17	0	18.99

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