Charles Etok Edwardsen Mitigation Bank

Prospectus

Sponsored by:



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In cooperation with:



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Prepared by:





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Appendix A – Wetland Mapping and Aquatic Site Assessment for a Proposed Wetland Mitigation Bank in Barrow, Alaska (Baseline Assessment)

Appendix B – AKWAM Assessment Forms

Acronyms and Abbreviations

AA	Assessment Area
ADF&G	Alaska Department of Fish and Game
ADN	Anchorage Daily News
ADOT&PF	Alaska Department of Transportation & Public Facilities
AKWAM	Alaska Wetlands Assessment Method
ATV	All-Terrain Vehicle
BEO	Barrow Environmental Observatory
BLM	Bureau of Land Management
CDM	Credit Debit Methodology
CEEMB	Charles Etok Edwardsen Mitigation Bank
CEC	Commission for Environmental Cooperation
CFR	Code of Federal Regulations
CWA	Clean Water Act
EIP	Ecosystem Investment Partners

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EPA	Environmental Protection Agency
ESA	Endangered Species Act
HGM	Hydrogeomorphic
HUC	Hydrologic Unit Code
IBA	Important Bird Area
IHLC	Inupiat History Language and Culture
IRT	Interagency Review Team
IUCN	International Union for the Conservation of Nature and Natural Resources
LTMP	Long-Term Monitoring Plan
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
NABCI	North American Bird Conservation Initiative
NOAA	National Oceanic and Atmospheric Administration
NPR-A	National Petroleum Reserve - Alaska
NPS	National Park Service
NSB	North Slope Borough
PPS	Percentage of Possible Scores
RGL	Regulatory Guidance Letter
ROD	Record of Decision
TCF	The Conservation Fund
TLUI	Traditional Land Use Inventory
UAF	University of Alaska Fairbanks
UIC	Ukpeaġvik Iñupiat Corporation
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

PROSPECTUS (33CFR 332.8(d)(2)/ 40 CFR 230.98(d)(2)

EIP III Credit Co, LLC, a business entity of Ecosystem Investment Partners (EIP), in cooperation with Ukpeagvik Iñupiat Corporation (UIC), is proposing to establish a wetlands mitigation bank near Utqiagvik, Alaska (Figures 1 and 2). EIP will act as Sponsor, and UIC will be the landowner and Long Term Steward. This prospectus provides an overview of the proposed Charles Etok Edwardsen Mitigation Bank and is the basis for review by the U.S. Army Corps of Engineers (USACE), in consultation with the Interagency Review Team (IRT). This document follows the process laid out in 33 CFR § 332.8 Mitigation banks and in-lieu fee programs and the November 2015 Alaska District Prospectus Review Process and Checklist for Mitigation Banks and In-Lieu Fee Programs (Mitigation Bank Checklist).

Proposed Mitigation Bank Details:

Identification:	Charles Etok Edwardsen Mitigation Bank
Mitigation Type:	Preservation
General Location:	Avak Creek/Elson Lagoon, Frontal Beaufort Sea
Service Area:	Arctic Coastal Plain
	Hydrologic Unit Code (HUC)s 190601, 190602, 190603, 190604, 190605
Coordinates:	71°16'26.55"N, 156°30'34.21"W
Legal:	Township 22N, Range 17W, Sections 5, 6, 7, 8, 16, 17, 18. Range 18W, Section 1. Umiat Meridian
Acres Protected:	2,294.18
Acres of Aquatic Resource	s: 1,570.83
Credits Proposed:	1,123.34

1. Objectives [33 CFR § 332.8(d)(2)(i)]

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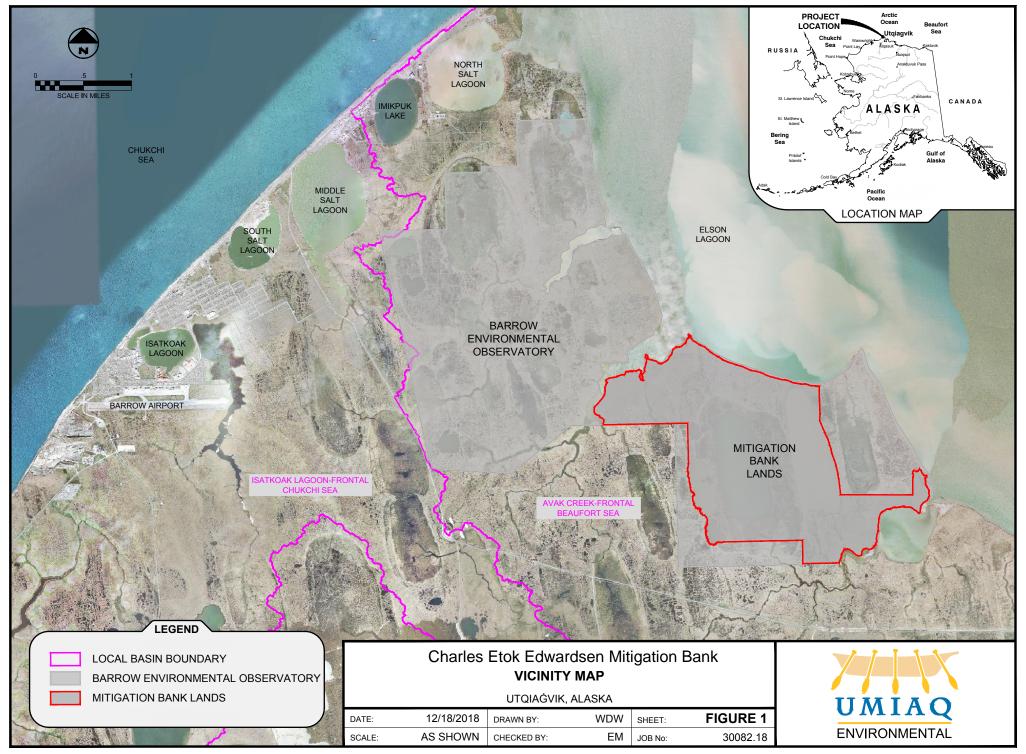
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Total

The Charles Etok Edwardsen Mitigation Bank (CEEMB) contains 1570.83 acres of aquatic resources as shown in Table 1, including 1521.50 acres of palustrine aquatic resources, 3.90 acres of estuarine aquatic resources, 13.87 acres of riverine aquatic resources, 3.37 acres of lacustrine fringe aquatic resources, and 28.19 acres of small ponds (palustrine permanently flooded unconsolidated bottom) (Figure 3). There are also 723.35 acres of lakes and no uplands occur onsite.

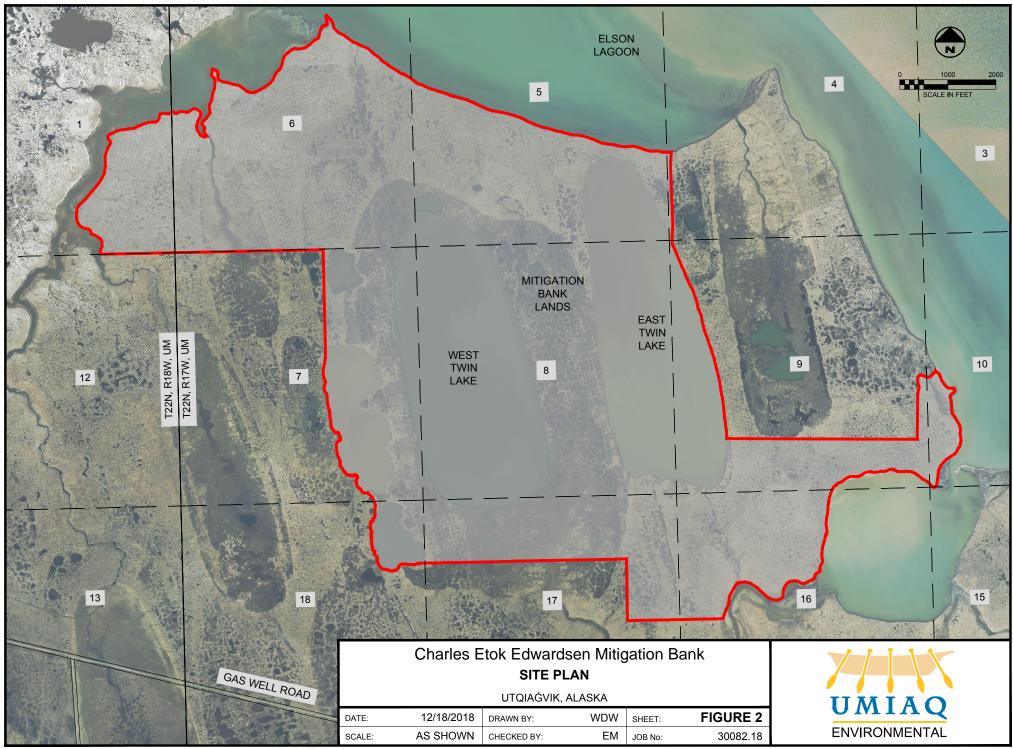
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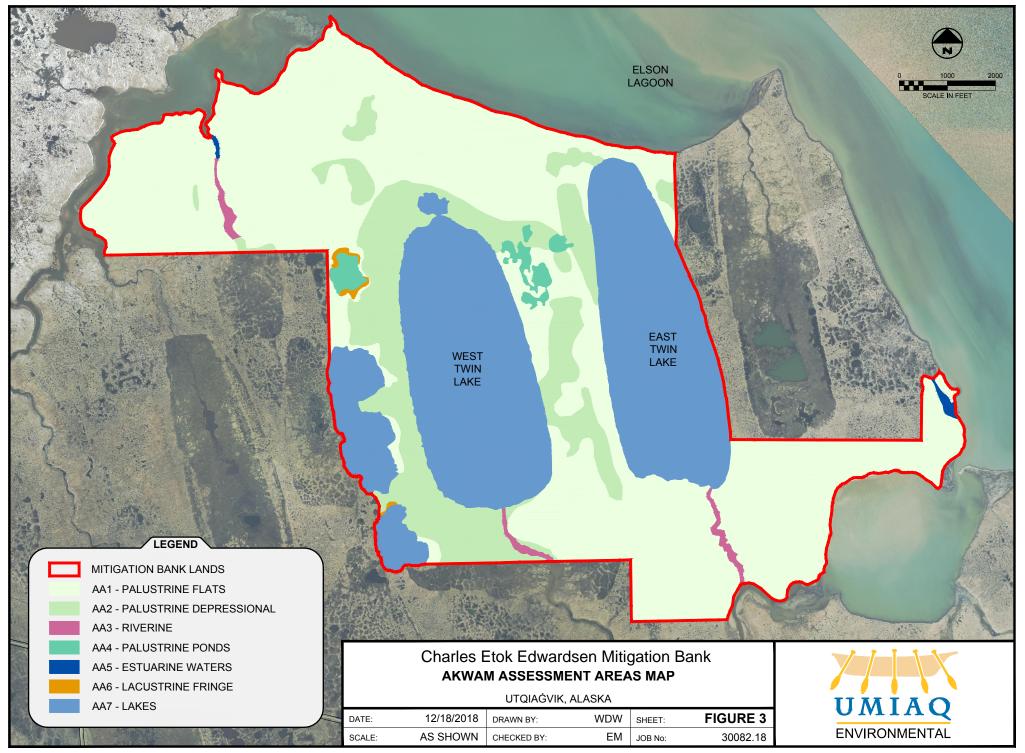


Table 1: Aquatic Resources in the CEEMB

Aquatic Resource Type	Acreage
Palustrine	1,521.50
Estuarine	3.90
Riverine	13.87
Lacustrine Fringe	3.37
Small Ponds	28.19
TOTAL ¹	1,570.83

¹ Lakes are not included in this total.

Preservation of wetlands is proposed as the method of compensation. The CEEMB was evaluated for preservation using a watershed approach and has been determined to be high priority for preservation because of its position in the landscape; it meets habitat requirements for important mammals, birds, and fish, and it is worth preserving based on threats of development observed at the watershed level.

2. Establishment and Operation [33 CFR § 332.8(d)(2)(ii)]

The proposed CEEMBC will be established as a private entrepreneurial bank by EIP (the Sponsor), in cooperation with UIC, subject to USACE approval. The CEEMB property is currently owned by UIC who, at the direction of the Sponsor, will record a Declaration of Restrictive Covenant over the property in the Barrow Recording District, Third Judicial District and assist with management as the Long-Term Steward. EIP has entered into a lease agreement with UIC and will be performing wetlands bank management services in accordance with the executed lease dated August 30, 2018.

Upon approval of the CEEMB by USACE, the Sponsor will open up one or more phases for operation, establish and fund the appropriate financial assurances, place permanent land restrictions for the open phases, and commence selling the first release of credits. Concurrently, boundary marking, monitoring, and maintenance activities will begin and continue throughout the life of the bank with an appropriate non-wasting stewardship endowment funded and in place.

The work plan for the CEEMB involves several establishment tasks to be completed within the first year, including:

- Task 1: Mark the property boundaries in prominent access locations with signs indicating that the site is private and permanently protected property.
- Task 2: Post signs at prominent points along trails.
- Task 3: Post signs along edge of the mitigation bank reminding users that wetlands are sensitive.
- Task 4: Communicate with the public about the CEEMB's status as a mitigation site, and that the site has been preserved in perpetuity.

Annual monitoring during the CEEMB's operational life will involve a qualitative assessment of the condition of aquatic resources and upland buffers, monitoring of the restrictive covenants, and signage on the CEEMB. The monitoring period will extend for 5 years following approval of the mitigation plan.

The Sponsor will monitor the site and provide reports to USACE no later than December 31st on year 1, year 3, and year 5 of the monitoring period. The monitoring report will follow the same protocol specified

in the Regulatory Guidance Letter of October 10, 2008, (RGL No. 08-03), including also the following information:

- Photographs taken from the southwest corner of the CEEMB (most likely ATV access), along the edge of Elson Lagoon, and at any points showing worn ATV trails.
- Aerial photographs taken every 2-3 years, as available, showing percent of vegetation cover when compared to previous aerial photograph.
- Aerial photograph showing the current location of coastline and erosion/ recession of the coastline which may have occurred since approval of the Mitigation Plan.
- A written description of the condition of the aquatic resources and their buffers.
- A written description of the status of the restrictive covenants
- A description of any work to replace signage or adaptive management requirements.
- A qualitative assessment to determine if adaptive management is needed. If adaptive management is deemed appropriate. The report will describe the plan and actions to accomplish adaptive management.

USACE may extend the monitoring period beyond 5 years and require additional monitoring reports if USACE determines from the reports submitted during the 5-year monitoring period that performance standards are not being met and baseline conditions are not being maintained. After bank closure, long term management will begin. The long-term management strategy for the CEEMB is described in Section 5.

3. Proposed Service Area [33 CFR § 332.8(d)(2)(iii)]

The Environmental Protection Agency (EPA) has identified and published ecoregion maps, areas where ecosystems (and the type, quality, and quantity of environmental resources) are generally similar. Designed to serve as a spatial framework for the research, assessment, and monitoring of ecosystems and ecosystem components, ecoregions denote areas of similarity in the mosaic of biotic, abiotic, terrestrial, and aquatic ecosystem components with humans being considered as part of the biota (CEC 2006). Wetlands within the CEEMB are representative of those on the Arctic Coastal Plain of Alaska, and are within EPA's level III Ecoregion 2.2.1, "Arctic Coastal Plain" (ACP). The ACP stretches westward across the northern coast of Alaska from Point Lay on the coast of the Chukchi Sea coast to Mackenzie Bay in Canada. Several watersheds, or hydrologic units, exist within the ACP (Figure 4).

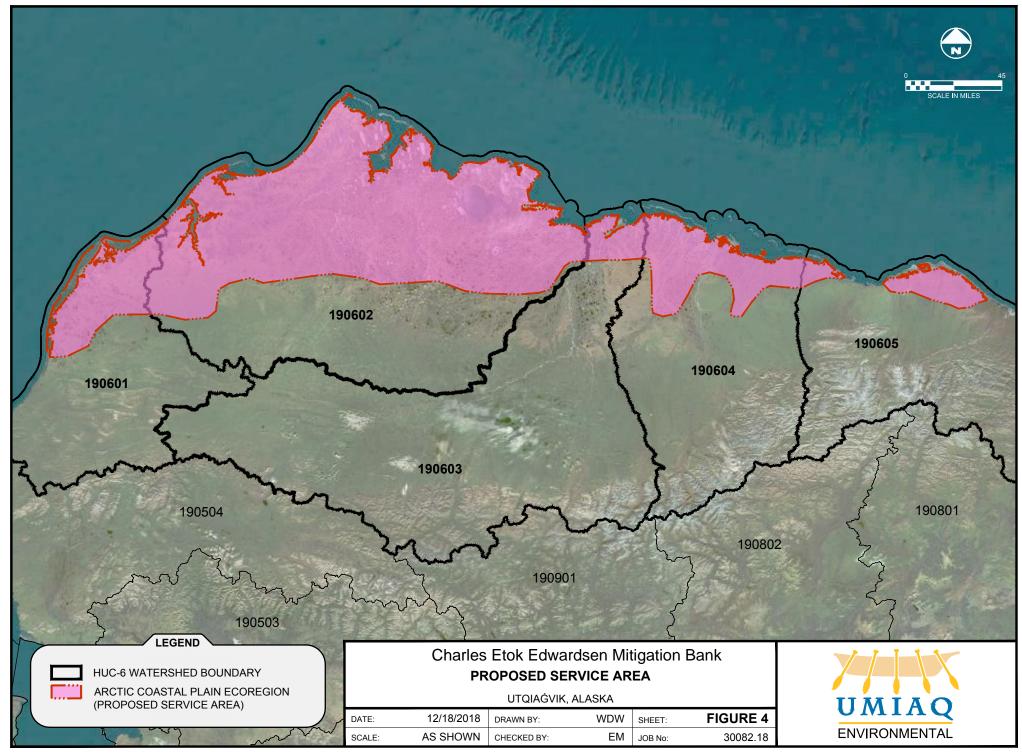
The U.S is divided and sub-divided into successively smaller hydrologic units which are identified by a unique hydrologic unit code (HUC) based on classification in the hydrologic unit system (USGS 2018). CEEMB is within the Utqiagvik unit (HUC 190602). The ACP exists within the following HUCs:

- Western Arctic HUC 190601
- Utqiaġvik (Barrow) Alaska HUC 190602
- Colville River HUC 190603
- Prudhoe Bay HUC 190604
- Eastern Arctic HUC 190605

It is proposed that projects within the ACP, and therefore within the above HUCs, be allowed to acquire the requisite mitigation at the CEEMB.

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4. Need and Feasibility [33 CFR § 332.3(d)(2)(iv), § 332.4(c)(3)]

The CEEMB was strategically selected using a watershed approach to preserve the quantity and quality of aquatic resources in the ACP watersheds. Factors considered in selecting this property included the presence of high-functioning wetlands with ecological importance to their watershed, the presence of threats to the property, and the importance of this property for preservation in the ACP watersheds. Specific attributes of the property meet the watershed needs and make this property appropriate and practicable for compensatory mitigation, including:

- Undeveloped high-functioning palustrine and estuarine wetlands within a frontal Beaufort Sea watershed;
- Unique and sensitive habitat for migratory birds (Important Bird Area), Species of Greatest Conservation Need (ADF&G 2015), species protected under the Endangered Species Act (ESA) (1973), and terrestrial species;
- Within a watershed which drains to an anadromous waterbody with three species of anadromous fish important for subsistence purposes;
- The property contains one critical site listed by the North Slope Borough (NSB) Department of Inupiat History Language and Culture (IHLC) on the Traditional Land Use Inventory (TLUI) (Nageak 2018);
- The area is in the path of development that would likely destroy the property's aquatic resources and their functions;
- Permanent protection and long-term management is available by the landowner (UIC) and Sponsor (EIP); and
- High priority for protection and long-term stewardship in the watershed evaluated with available quantitative assessment tools and best professional judgement.

Preservation and long-term stewardship of the CEEMB site is a priority because the functions provided by the site's aquatic resources are under threat from development. Scientific research installations are currently encroaching the CEEMB site and will increase in abundance as the community grows and expands inland. Oil, gas, and mineral development already exists nearby and could occur within the CEEMB or expand and compromise the Site's aquatic resources if it is not protected and cared for.

The land is currently owned by UIC and is within the Barrow Environmental Observatory (BEO), which has supported marine and terrestrial scientific research since 1947. The BEO is managed by UIC Science, who provides technical and logistical management and support services to scientific research teams. UIC Science is based nearby and employees familiar with the CEEMB lands will play a role in ongoing monitoring and maintenance.

Oil and gas rights under the CEEMB site are reserved to the United States and it is not practicable to acquire the subsurface rights. However, within the National Petroleum Reserve – Alaska (NPR-A), there is a federally-designated one-mile buffer from the coastline where exploratory well drill pads, production well drill pads, or a central processing facility for oil or gas are not allowed (BLM 2013). In the event that these lands are precluded from this buffer because surface rights are privately held, the avoidance, minimization and mitigation measures of the Clean Water Act (CWA) 404 program would require development to occur outside of the restrictive covenant.

The following factors were considered in selecting the CEEMB:

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- Plant Communities: The plant communities are established, largely undisturbed, and will have low vulnerability to change after the site is preserved.
- Invasive Exotic/Noxious Species: The vulnerability of the site to colonization by invasive exotic or noxious species is low because there are few recruitment sources nearby, the site has low suitability for establishment, and the size of the property reduces edge effects.
- Water Quality: The vulnerability of the mitigation site to experience degraded water quality is low because the site is undisturbed and the surrounding land uses are largely undisturbed.
- Water Quantity: The vulnerability of the mitigation site to negative hydrological conditions is low because the Beaufort Sea coast and local hydrology are unlikely to change in the foreseeable future.
- Indirect Impacts: The vulnerability of the mitigation to indirect impacts is low because the site is large and bounded by lands under ownership and control of UIC.
- Direct Impacts: The vulnerability of the mitigation site to direct impacts will be non-existent because the protections to be implemented (i.e., management by Long-Term Steward and restrictive covenant) will eliminate the potential for impacts.

In June 2018, USACE and the EPA signed a Memorandum of Agreement (MOA) concerning *Mitigation Sequence for Wetlands in Alaska under Section 404 of the Clean Water Act*. According to the MOA, "Compensation for impacts to [permafrost wetlands] should be provided, if practicable, through in-kind rehabilitation, enhancement, or preservation since there is greater certainty these methods of compensation will successfully offset permitted impacts" (USACE & EPA 2018). However, the MOA also recognizes that in areas of permafrost, restoring, enhancing, or establishing in-kind wetlands for compensatory mitigation may not be practicable due to the technical limitations. Permafrost wetlands are either frozen or not, making them difficult or impossible to replace once thawed or damaged (USACE & EPA 2018). Currently, there are no wetlands mitigation banks on the North Slope of Alaska which preserve permafrost wetlands. The proposed CEEMB will offer a much needed resource for projects which involve filling these unique wetlands in Arctic Alaska.

5. Ownership Arrangements and Long-Term Management Strategy [§ 332.8(d)(2)(v)]

5.1. Site Protection Instrument

The CEEMB property is currently owned by UIC. To permanently protect the site. UIC will record a Declaration of Restrictive Covenant in the Barrow Recording District, Third Judicial District, at the direction of the Sponsor.

Oil and gas on the CEEMB are reserved to the United States. As such, it is not practicable for EIP to acquire the subsurface rights. Within the National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan, there is a federally-designated one-mile buffer from the coastline where exploratory well drill pads, production well drill pads, or a central processing facility for oil or gas are not allowed (BLM 2013). In the event that these lands are precluded from this buffer because surface rights are privately held, the avoidance, minimization and mitigation measures would require development to occur outside of the restrictive covenant.

5.2. Long-Term Management

Management activities (both short term and long term) on the CEEMB will be implemented to ensure the integrity of the site's aquatic resources in accordance with the restrictive covenants. The Sponsor (EIP) will be responsible for managing and maintaining the site for as long as the bank is open with credits

remaining. As the Long-Term Steward, UIC will have the primary responsibility for monitoring and maintaining the CEEMB after the Bank is closed and will be the holder of the associated Non Wasting Stewardship Endowment. The Sponsor and UIC as the Long-Term Steward will recognize the rights of USACE to enforce the terms of the Restrictive Covenants. The Long Term Management Plan (LTMP) includes the continuous monitoring of the site, replacement of signage, enforcement of the restrictive covenants, and, if the integrity is compromised, adaptive management in consultation with USACE.

The Long-Term Steward and USACE may meet and confer from time to time, upon the request of any one of them, to revise the LTMP to better meet management objectives and preserve the habitat and conservation values of the CEEMB. Any proposed changes to the LTMP shall be discussed with USACE and the Long-Term Steward. Any proposed changes will be designed with input from all parties. Amendments to the LTMP shall be approved by USACE in writing and shall be implemented by the Long-Term Steward.

If the USFWS determines, in writing, that continued implementation of the LTMP would jeopardize the continued existence of a state or federally listed species, any written amendment to this LTMP, determined by the USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the Long-Term Steward.

In an event of dispute between USACE and the Long-Term Steward concerning interpretation and application of the LTMP, USACE shall consider comments from EIP and/or information provided by an independent review. If the dispute is a result of the Long-Term Steward failing to implement the tasks described in this plan and is notified of such failure in writing by USACE, the Long-Term Steward shall have 90 days to cure such failure. If failure is not cured within 90 days, USACE may designate a replacement Long-Term Steward in writing. Upon written notice of replacement, the Long-Term Steward shall tender all money and property to the new Long-Term Steward and shall be discharged from all duties and responsibilities.

If the land is compromised (through illegal dumping, building or other land disturbance), the work of maintenance will be to remove the compromise and restore the land. If this happens, a discussion will occur with USACE as to the proper restoration of the issue. This maintenance will be ongoing into long term management. No additional maintenance other than what is described herein is anticipated.

To support ongoing monitoring and maintenance at the CEEMB, EIP will provide funds to UIC for a nonwasting endowment fund, which will be sufficient to generate the annual income needed to meet the costs to maintain the site. This endowment will be maintained by the Long-Term Steward in an approved financial institution of the Long-Term Steward's choice.

6. Sponsor Qualifications [33 CFR § 332.8(d)(2)(vi)]

The Sponsor, EIP, has successfully permitted, constructed and managed over 40 mitigation banks in 10 Corps Districts nationally. Information on these projects can be found at: https://ecosystempartners.com/endangered-species-stream-and-wetland-mitigation-banks/.

In addition, EIP's team of 12 principals and staff bring a wealth of knowledge and experience in all of the aspects required for successful project design, establishment and implementation. EIP's Managing Partner Nick Dilks has extensive experience in land conservation finance and real estate. Prior to founding EIP, he spent 10 years with The Conservation Fund, most recently as its Vice President for Real Estate, completing some of TCF's most complex and innovative transactions. EIP's Director of Operations, David Urban has

successfully permitted, designed, and operated over 50 mitigation banks and restoration projects in Chicago, Rock Island, Detroit, Omaha, Mobile, New Orleans, Jacksonville, Norfolk, Philadelphia, Huntington, Louisville, Pittsburgh, St Paul, Sacramento, Los Angles, Galveston and Ft. Worth districts of the USACE. More on the EIP team at: https://ecosystempartners.com/.

7. Ecological Suitability [33 CFR § 332.8(d)(2)(vii)(A)]

The resources to be preserved at the CEEMB provide important physical, hydrological, chemical, and biological function to the ACP watersheds.

Preservation of the CEEMB is a priority in part due to the important habitat which is provided by this site to species protected by the State of Alaska and the U.S. government. The CEEMB provides habitat to three species listed as threatened under the ESA, 29 regularly occurring Species of Greatest Conservation Need (ADF&G 2015), and countless avian species protected by the Migratory Bird Treaty Act (MBTA) (1918). The CEEMB is within the Planning Area and Moderate Use Area for the USFWS' Steller's Eider Conservation Plan for Barrow, Alaska (2004), which "recognizes that cumulative loss and degradation of eider habitat in this [use area] could detrimentally affect recovery of Steller's eiders" (USFWS 2004).

The field survey for the Baseline Assessment (Appendix A) included the CEEMB and surrounding lands within the BEO (ABR 2015). Wetlands were determined, boundaries were interpreted, and wetlands and waters were classified by dominant vegetation and water regime. An aquatic site assessment (functional assessment) was performed to define environmental conditions, characteristics, and develop wetland functional classes.

The most common wetland types at the site can be described as Palustrine Semipermanently Flooded Persistent Emergent (PEM1F), Palustrine Seasonally Flooded/Saturated Persistent Emergent meadow (PEM1E), and Palustrine Saturated Persistent Emergent meadow (PEM1B). The ABR report (ABR 2015) (Appendix A) provides details about the 41 plots assessed over the property. One of the important characteristics of this site is the persistence of the vegetative communities and their undisturbed nature.

The PEM1F and PEM1E wetlands are a component of lowland areas surrounding lakes or within a drained lake basin. The PEM1F wetland type is most commonly a patterned feature with wetter areas occupying micro-lows. The PEM1F areas consist of moist high zones and the wet depressions. The microtopographic depressions are typically dominated by wetland obligate sedges including water sedge (*Carex aquatilis*), tall cottongrass (*Eriophorum angustifolium*), and red cottongrass (*E. russeolum*). Areas with surface water support stands of Arctic pendant grass (*Arctophila fulva*). The moist wetland types also support a variety of sedges and limited dwarf shrub cover including tealeaf willow (*Salix pulchra*), oval-leaf willow (*S. ovalifolia*), and least willow (*S. rotundifolia*). PEM1E has a plant community composition very similar to that of PEM1F, with wet micro-low and more mesic micro-high zones. PEM1E was differentiated from PEM1F through aerial photo interpretation; it has less surface water visible in the imagery. PEM1F and PEM1E are present as depressional areas and flats, respectively, on this property. Soils are typically histic epipedons with a high-water table and saturation to the surface.

The other very common vegetative community as this site is PEM1B, which are present as flats on this property. The plant communities are dominated by a variety of emergent species including Arctic sweet coltsfoot (*Petasites frigidus*), Arctic woodrush (*Luzula nivalis*), *Carex aquatilis, Eriophorum angustifolium*, and *L. confusa*. The dwarf shrub *Salix rotundifolia* is occasionally codominant. This wetland was typically

associated with raised convex slope features occurring on banks along the coast or along the margins of lake basins. The hydric soil indicators Alaska Redox and positive reaction to alpha, alpha-dipyridol were present. In addition, saturation was observed within the top 12 inches of the soil profile.

Several variations on the wetlands described above occur throughout the CEEMB: Palustrine Permanently Flooded Persistent Emergent Marshes (PEM1H), Palustrine Temporary-Tidal Persistent Emergent (PEM1S), Palustrine Permanently Flooded Unconsolidated Bottom Ponds (PUBH), Riverine Intermittent Vegetated Streambed (R4SB7), and Estuarine Intertidal Irregularly Flooded Unconsolidated Shore (E2USP).

The PEM1H wetlands are permanently flooded lacustrine fringe wetlands within the study area, which are present as depressional wetlands on this property. The plant community is dominated by *Arctophila fulva* and Pallas' buttercup (*Ranunculus pallasii*), with a thick floating mat of obligate wetland mosses. Soils are histosols or histic epipedons with permanent surface water.

The Palustrine Temporary-Tidal Persistent Emergent (PEM1S) wetlands are tidally influenced freshwater types which occur on the raised coastline of the study area and are present as flats on this property. This community type supports an emergent vegetation mat that includes scurvygrass (*Cochlearia officinalis*), *Eriophorum angustifolium*, northern woodrush (*Luzula confusa*), Fisher's tundragrass (*Dupontia fisheri*), and *Arctophila fulva*. PEM1S usually occurs on raised convex banks that support moist wetland communities. Histic epipedons are a common hydric soil type. Primary hydrologic indicators (e.g., saturation) were absent at the time of sampling, but the secondary hydrology indicators shallow active layer (shallow aquitard) and FAC neutral test were present.

The PUBH ponds occur throughout the bank site and are shallow open water areas without islands but may have polygonised margins.

The R4SB7 areas within the site occur within flats and depressional wetlands areas of the site and function as outflows to Ikpik Slough and the Mayeoak River system. The dominant emergent vegetation is *Carex aquatilis, Eriophorum* spp., *Arctophila fulva* and *Hippuris vulgaris*. In ABR 2015 these areas were described as palustrine wetlands (PEM1F, PEM1E). In reviews of the site's aerial imagery through time several areas were noted to exhibit outflow characteristics. Three were identified as being more similar to Riverine Intermittent Vegetated Streambed than PEM1E or PEM1F.

The E2USP features were mapped immediately adjacent to the nearshore marine waters of Ikpik Slough. At the time of the field survey, these E2USP waters had no direct surface water connection to the nearshore marine waters, but EC values were out of range of the meter used (> 20,000 μ S/cm), indicating the salt concentration of the water exceeds that of freshwater (Riverine and Palustrine) systems. Waters are saline with an irregularly flooded regime receiving salt water input during storm surges.

Wetlands in the CEEMB were evaluated on wetland functions that were specific to the Arctic Coastal Plain and rated highest in providing the following functions: sediment/ nutrient/ toxicant removal, educational/ scientific/ recreational/ subsistence use, fish habitat suitability, and threatened and endangered species support. Upon evaluation, wetlands were assigned a category I, II, or III according to their overall functional capacity, following the guidelines in the USACE Ratios for Compensatory Mitigation (USACE 2014). According to the Baseline Assessment, 98.6% of the study area is considered category I, which is defined as wetlands that (1) provide documented habitat for threatened and endangered species; (2)

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represent a high quality example of a rare wetland type; (3) are rare within a given region; (4) provide habitat for very sensitive or important wildlife or plants; and/or (5) are undisturbed and contain ecological attributes that are impossible or difficult to replace within a human lifetime, if at all (ABR 2015). The list of regularly occurring wildlife species within the BEO includes 35 birds and 9 mammals, which is considered highly diverse according to functional classification performed in the Baseline Assessment (ABR 2015). Of these species, 24 of the 35 birds and 5 of the 9 mammals have been identified by the ADF&G as Species of Greatest Conservation Need (ADF&G 2015).

The North Slope of Alaska provides nesting, breeding, and rearing habitat for millions of migratory birds. The site is between two Important Bird Areas (IBA) as designated by Audubon Alaska, the Chukchi Sea Nearshore IBA and the Barrow Canyon and Smith Bay IBA (Audubon Alaska 2014). Two of the bird species which find breeding, nesting, and rearing habitat within the mitigation site are Steller's and spectacled eiders, both of which are listed as threatened under the ESA. Steller's and spectacled eiders are also categorized as vulnerable on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List and the NatureServe Explorer Global Status, which catalog species' risk of global extinction when evaluated by their published criteria (IUCN 2018, NatureServe 2018). Additionally, both eiders are listed on the North American Bird Conservation (NABCI)'s State of the Birds 2016 Watch List as a species of high conservation concern (NABCI 2016).

The CEEMB is also within the range of polar bear which are also listed as threatened under the ESA and categorized as vulnerable on the IUCN Red List. Polar bear barrier island critical habitat exists opposite of Elson Lagoon along the Plover Islands, and within Elson Lagoon at locations south of the CEEMB. The site itself does not contain denning habitat, as the wetlands have generally low topographic relief (ABR 2015).

Habitat also exists within the CEEMB for the yellow-billed loon, which has been considered for listing under the ESA beginning in 2004. The U.S Fish and Wildlife Service (USFWS) determined in 2014 that the yellow-billed loon is not warranted for listing, but it remains a priority species for the USFWS Alaska Region (USFWS 2014). In early 2015, a land trade between the Bureau of Land Management (BLM) and UIC was considered in which BLM would gain surface rights of approximately 3,200 acres just south of the CEEMB boundary, in order to protect yellow-billed loon habitat (BLM and UIC Meeting, February 2015).

The CEEMB is within the Avak Creek-Frontal Beaufort Sea watershed (HUC 1906020201). Avak Creek flows southeast from Ikroavik Lake, discharging into Iko Bay of Elson Lagoon. Avak Creek is an anadromous waterbody listed in the Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (Anadromous Waters Catalog) (ADF&G 2018). In Avak Creek, broad whitefish, least cisco, and sockeye salmon are known to be present, all of which are categorized by ADF&G as Species of Greatest Conservation Need.

In addition to providing important habitat, the CEEMB is uniquely located in an area with cultural and potential archaeological significance. The community of Utqiaġvik is located adjacent to the NPR-A, approximately 250 miles west of the Arctic National Wildlife Refuge (Arctic Refuge), and approximately 205 miles north of the Gates of the Arctic National Park and the Noatak National Preserve. Across Elson Lagoon from the CEEMB lies the Birnirk National Historic Landmark, also known as Pigniq. The landmark is composed of 19 mounds on beach ridges made up of ancient sod houses, meat caches, and cultural debris (UAF 2016). Technology developed at this site, and other similar sites, supported rapid population expansion across the arctic regions of North America and Greenland (NPS 2018). No comprehensive archaeological study has been completed at the CEEMB, however lands around Elson Lagoon contain

multiple sites listed on the NSB's TLUI which is an inventory of historic, archaeological, and cultural sites within the NSB (NSB 2014). One such site known as Tikiġaaġruk is within the CEEMB, and contains a historical summer hunting camp, duck hunting area, and a site used by reindeer herders (Nageak 2018).

8. Water Rights [33 CFR § 332.8(d)(2)(vii)(B)]

UIC holds surface rights, including water rights in and around the CEEMB. Precipitation and erosion on the coastal edges of the CEEMB occurs naturally and will not be controlled by the Sponsor or UIC. Upon recording the Restrictive Covenant, neither onsite nor offsite hydrological disturbance is expected to affect the bank.

9. Preservation Criteria [33 CFR § 332.3(h)]

This project meets the five criteria for preservation identified in 33 CFR § 332.3(h):

(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;

The CEEMB contains valuable aquatic resources, provides important functions and services, and contributes to the protection and sustainability of the ACP watersheds. This area contains pristine wetlands that retain sediment, nutrients, and remove toxicants, regulate flood flow, provide erosion control and shoreline stabilization, maintain the soil thermal regime, provide and export organic matter, support fish, avian, and mammal habitat including habitat for threatened and endangered species, and provide important scientific and subsistence use.

(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;

As detailed in Section 7, 69% of birds and 56% of mammals which are regularly occurring within the CEEMB have been identified in Alaska's Wildlife Action Plan as Species of Greatest Conservation Need (ADF&G 2015). Three of these species that regularly occur within the site are listed as threatened under the ESA, including the polar bear, Steller's eider, and spectacled eider. Polar bear barrier island critical habitat exists opposite of Elson Lagoon along the Plover Islands, and within Elson Lagoon at locations south of the CEEMB. These birds and mammals are reliant on the aquatic resources provided in the CEEMB for their habitat.

The adjacent Avak Creek is an anadromous waterbody listed in the Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (Anadromous Waters Catalog) (ADF&G 2018). It is typical of anadromous fishery streams throughout the ACP. In Avak Creek, broad whitefish, least cisco, and sockeye salmon are known to be present, all of which are categorized by ADF&G as Species of Greatest Conservation Need.

The site provides important bird habitat that is typical of the ACP. It is proximate to and between a series of IBAs as designated by Audubon Alaska (Audubon 2014). It is immediately adjacent to both the Chukchi Sea Nearshore and Barrow Canyon and Smith Bay IBAs, which are immediately adjacent to the "ecologically similar" Ledyard Bay to Icy Cape and Beaufort Sea Nearshore IBAs. The bank site is proximate

to the Teshekpuk Lake Area IBA, as well as the "ecologically similar" Colville River Delta, Northeast ACP and Kasegaluk Lagoon IBAs.

In addition, the site is used by Steller's and spectacled eiders which are categorized as vulnerable on the IUCN Red List and the NatureServe Explorer Global Status, which catalog species' risk of global extinction when evaluated by their published criteria (IUCN 2018, NatureServe 2018). Additionally, both eiders are listed on the North American Bird Conservation (NABCI)'s State of the Birds 2016 Watch List as a species of high conservation concern (NABCI 2016).

(iii) Preservation is determined by the district engineer to be appropriate and practicable;

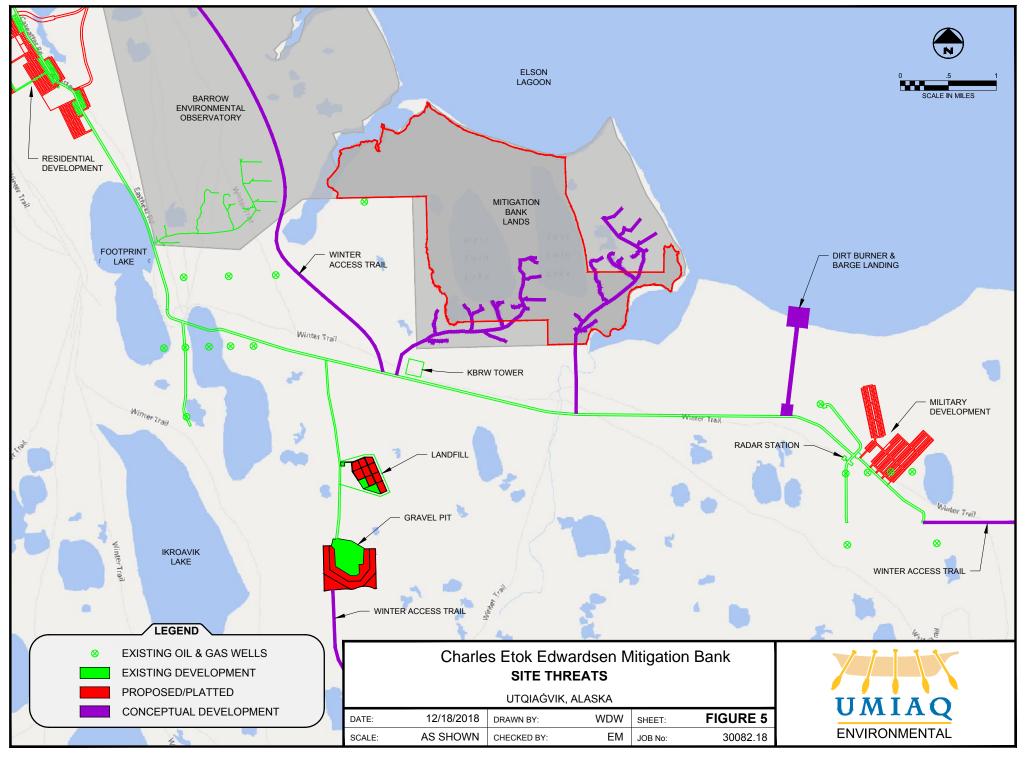
On March 12, 2015 UMIAQ met with USACE to discuss and locate a suitable place for a wetland mitigation bank and settled on the proposed CEEMB site as meeting the preservation site criteria. This site was further discussed and solidified in a meeting of UMIAQ, The Conservation Fund (TCF) and USACE on November 19, 2015. A series of discussions between UMIAQ and USACE since that time have all focused on this site, including a site visit by USACE during the week of July 24, 2017, as well as subsequent discussions.

(iv) The resources are under threat of destruction or adverse modifications;

The CEEMB is under threat of destruction or adverse modification from scientific and commercial developments. Threats to the property include habitat destruction, fragmentation, and water quality degradation. Sources of the threat include scientific research and associated installations, oil and gas development, port development, and encroachment from the nearby community of Utqiaġvik (Figure 5).

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Scientific Research Installations

The Utgiaġvik region is the heart of scientific research and development endeavors on the North Slope of Alaska. For centuries, Utgiagvik has been a frontier field establishment for basic scientific investigations of the Arctic environment (Shelesnyak 1948). More recently, Utgiagvik has been called "ground zero" for climate change, as scientists flock from around the globe to study sea ice, erosion, permafrost, and other Arctic phenomena (Reiss 2010). Scientific research is increasing due to climate change and commercial development



Figure 5: National Environmental Observation Network equipment within the BEO

on Alaska's North Slope. The CEEMB is within the Barrow Environmental Observatory (BEO), which has supported marine and terrestrial scientific research since 1947. The BEO is managed by UIC Science, who provides technical and logistical management and support services to scientific research teams. UIC Science reports an all-time high in interest in the Arctic, especially among U.S. government agencies (UIC 2016). In previous decades, research consisted mostly of manual recording of measurements and real-time observations. However as technological capabilities increase and the ability to use technical instrumentation in Arctic environments improves, how research occurs is changing. In recent years many teams have proposed and are installing monitoring devices for several years or an indefinite timeline. Interest in installing long-term monitoring equipment by the Federal government and universities is increasing.



Monitoring stations have been installed for Atmospheric Radiation Monitoring, (Figure 6) National Environmental the **Observation Network (Figure 7)** and proposed for vessel traffic counts, mammal and avian observation, and many other projects (UIC 2016). These installations require large tracts of land, power, road and trail access, and emergency

Figure 6: Powered Atmospheric Radiation Monitoring station in the BEO

accommodations. As governments and engineering experts attempt to provide creative solutions to solve climate change's most pressing issues, teams are looking for test plots to experiment with tundra response to warming, drought, fires, seeding/ revegetation, and other erosion and warming concerns (Tsuyuzaki 2017).

Already on BEO lands, lakes have been dammed to measure evaporation, organic mats have been removed to measure permafrost melt, areas have been enclosed to monitor vegetation growth without

wildlife presence, animals have been captured and killed, and hydrology has been modified (Mitchell 2016).

Abandonment of research projects within the BEO has been an issue for many years. Accumulation of thousands (9,600 as of January 2013) of research complicates sites management, and there has been no comprehensive effort to determine which projects have long-term value or may warrant removal when completed (Figure 8). The ability to locate new sites on the BEO



Figure 7: Barrow Area Research Sites (BAID 2018)

without impeding or impairing other research projects is becoming increasingly difficult (UMIAQ 2013). Installations must be removed because they have left behind damage to tundra and debris. This has become such an issue that UIC has proposed implementing a performance bond requirement for removal of research projects.

An additional concern in continuing to develop the BEO and the CEEMB is the potential to impact archaeological and cultural resources. Local UIC Science archaeologist Dr. Anne Jensen has noted that the area has not been cleared for archaeological significance, and the existing research sites/ installations themselves may qualify as historic sites.

The BEO does have protection in its zoning as a Scientific Research District by the NSB. Due to this zoning some land uses are restricted, however, use of heavy equipment for research installations, environmental manipulation, and subsistence use is allowed (NSB Municipal Code § 19.40.075). Further, this zoning protection was requested by UIC as the landowner, and can be undone. UIC leadership and position on land preservation can and likely will change over time.

The NSB Planning Commission approved the current BEO Master Plan in 2013. The approved Master Plan is intended to show all projects and uses of land to occur on the parcel for at least 10 years (2013-2123). Two new access roads into the BEO are proposed in the Master Plan, one of which extends from Gas Well Road near the KBRW Tower in the direction of West Twin Lake and the CEEMB. The northern half of the BEO is occupied by many installations, and the new access road, when constructed, will be the most economical and logical place to begin installing monitoring equipment and performing environmental manipulations. Proposed developments show the trend is to move scientific research into the CEEMB.

Oil, Gas, and Mineral Development

Natural gas and oil development exists just inland from the CEEMB along Gas Well Road (also known as Gas Field Road and Oil Field Road). Gas Well Road extends south of Utqiaġvik through historical oil and natural gas wells which are a mix of active and plugged/ abandoned installations. Legacy oil wells and

natural gas wells are prominent in this region in part due to the location of the Avak Crater south of Utqiaġvik along the southeastern border of the BEO. The Avak Crater is an impact crater which was formed between 95 million and 3 million years ago and trapped gas in the [Utqiaġvik] fields (Kirschner and Grantz 1990).

Lands surrounding Utqiagvik are primarily held by UIC with subsurface rights, including mineral rights, being held by the BLM. At the CEEMB, BLM holds subsurface rights and can open oil and gas leasing as well as mining within the site if requested and deemed in the public interest (Kendor 2013).

Oil and gas development within Alaska's North Slope has primarily been within the Prudhoe Bay Region approximately 200 miles from Utqiaġvik, although there are large developments active and planned in Kuparuk, and exploration has occurred in the Chukchi Sea, along the Beaufort Sea coast at Cape Simpson/ Smith Bay, and location across the North Slope. Utqiaġvik is a community with potential for rapid expansion due to oil and gas development. The 2015-2035 Barrow (Utqiaġvik) Comprehensive Plan emphasizes this potential for change by including separate forecasts for population, public facilities, and services both with and without oil and gas development. Interest in Chukchi Sea lease exploration has waned since 2015 (ADN 2016), but potential for development onshore and additional exploration is still very real. As oil and gas development continues to creep closer to the community, construction of projects such as the deep water port and year-round road to Prudhoe Bay will continue to fragment area wetlands.

The CEEMB is adjacent to the National Petroleum Reserve – Alaska (NPR-A). The NPR-A is owned by the U.S. government and managed by BLM. BLM holds annual oil and gas lease sales within the NPR-A. According to the NPR-A Record of Decision (ROD), exploratory drill pads, production well drill pads, or a central processing facility for oil or gas are not allowed within a one-mile buffer from the coastline. However, "other facilities necessary for oil and gas production within NPRA that necessarily must be within this area (e.g., barge landing, seawater treatment plant, or spill response staging and storage areas) would not be precluded. Nor would this stipulation preclude infrastructure associated with offshore oil and gas exploration and production or construction, renovation, or replacement of facilities on existing gravel sites" (BLM 2013).

In addition to managing NPR-A lands, BLM also holds subsurface rights at the CEEMB. As subsurface rights holder, BLM could utilize this site for any number of activities it deems to be in the public interest, including oil and gas development and mining (43 CFR § 3602.31).

Port Development

Development of Elson Lagoon including construction of a deep water port for barge access and shipping operations has been proposed for many years. The landowner, UIC, contracted a feasibility study in 2015 to evaluate the economic viability and has explored funding partnerships. Currently the port access is conceptualized north of the CEEMB, but there is potential for the port to move south in order to avoid a National Oceanic and Atmospheric Administration (NOAA) Clean Air Sector (Figure 9). NOAA measures air quality from a location along the northern boundary of the BEO, and in order to get accurate results requires extremely minimal (preferably zero) emissions within the Clean Air Sector, which extends across Elson Lagoon just south of the proposed port location (UMIAQ 2013). Port development within the CEEMB could feasibly occur depending on future access points and coastal bathymetry.

Utqiaġvik Community Buildout

Utqiagvik is a coastal community which may only grow inland towards the CEEMB. Extreme erosion at some locations along the Chukchi Sea coast is accelerating the move inland. Gas Well Road is the only year-round access to lands south and east of Utqiagvik. The NSB maintains Gas Well Road and has been making improvements over the last several years. Road improvements increase the potential for

development within the CEEMB by allowing ease of access, especially into areas adjacent to Elson Lagoon.

Platted subdivisions and radio towers already exist on the northern and southern ends of Gas Well Road. The platted subdivision on the southern end of Gas Well Road is intended to be used in the event that full-time military presence is required in Utgiaġvik. Community infrastructure sited along the road, such as the community landfill and the UIC-owned gravel pit, have been permitted to increase in size

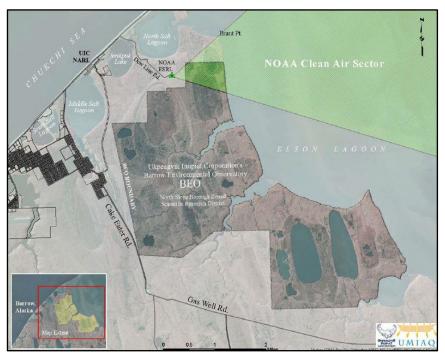


Figure 8: NOAA Clean Air Sector in Elson Lagoon

over the next several years. UIC has expressed interested in purchasing a dirt burner to assist with area soil remediation, which will require barge access from Elson Lagoon and land infrastructure off of Gas Well Road.

A winter access trail currently extends from the southern end of Gas Well Road when required by industry. A NSB maintained and permitted community winter access trail extends from Utqiaġvik to Atqasuk and Prudhoe Bay. There have been discussions to construct this winter trail from the end of Gas Well Road or from the UIC gravel pit to utilize existing infrastructure when possible. Should this occur, it is likely that a seasonal trail further north through the BEO would be established to move equipment to the barge landing in Utqiaġvik. The long-term vision for access to Prudhoe Bay from Utqiaġvik is a permanent gravel roadway (ADN 2018).

 (v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust). §332.3(h)]

The landowner, UIC, will record a Declaration of Restrictive Covenant in the Barrow Recording District, Third Judicial District, and submit to USACE. UIC recognizes the rights of USACE to enforce the terms of the Restrictive Covenant.

Additional Proposed Terms

10. Determination of Credits [33 CFR § 332.3(f)]

Significant work has been completed on this site, as evidenced by the ABR report (ABR 2015) (Appendix A), a July 2017 agency field assessment, and the ongoing series of meetings and calls with the USACE regarding the property. The ABR report performed a wetland functional assessment of the study area based on the widely utilized AKWAM methodology; that assessment has been formalized in this prospectus according to the AKWAM scoring methodology. As described below, the ABR functional assessment was used as the basis for this credit determination. EIP proposes that this method be used for the CEEMB. The adjacent AR-9 in-lieu-fee mitigation project by The Conservation Fund was also assessed by ABR (ABR 2015) using AKWAM, thus the assessment here would be comparable.

10.1. Baseline Information

As discussed in Section 7, ABR performed baseline assessment, as reported in the Wetland Mapping and Aquatic Site Assessment for a Proposed Wetland Mitigation Bank, Barrow, Alaska (ABR 2015) (Baseline Assessment). The wetlands assessed in this field survey included the CEEMB and surrounding lands within the BEO. Wetlands were determined, boundaries were interpreted, and wetlands and waters were classified by dominant vegetation and water regime. In addition to the wetland delineation, an aquatic site assessment (functional assessment) was performed to define environmental conditions, characteristics, and develop wetland functional classes. Per the AKWAM methodology, wetlands in the CEEMB rated highest in providing the following functions: sediment/ nutrient/ toxicant removal, educational/ scientific/ recreational/ subsistence use, fish habitat suitability, and threatened and endangered species support.

According to the Baseline Assessment, much of the CEEMB is considered wetlands which (1) provide documented habitat for threatened and endangered species; (2) represent a high quality example of a rare wetland type; (3) are rare within a given region; (4) provide habitat for very sensitive or important wildlife or plants; and/or (5) are undisturbed and contain ecological attributed that are impossible or difficult to replace within a human lifetime, if at all (ABR 2015).

As a supplement to the Baseline Assessment, three areas identified as palustrine wetlands in the Baseline Assessment were redelineated in this prospectus as riverine wetlands based on aerial imagery and site photos (Figure 3).

10.2. Credit Methodology

Each credit is assigned to wetlands based on the wetland functional classes identified in the Baseline Assessment, grouped by hydrogeomorphic (HGM) class into Assessment Areas (AA)s. The wetland functional classes from the Baseline Assessment were based on Cowardin classification, HGM class, physiography, vegetation, and microtopography (Cowardin 1979). The Baseline Assessment included an aquatic site assessment of wetland functions, but it did not determine wetland assessment scores. In order to translate the aquatic site assessment into a form that can be used for credit considerations, the 2010 Alaska Department of Transportation and Public Facilities (ADOT&PF) Alaska Wetland Assessment Method (AKWAM) was used to assess wetland functions and assign scores for credit production (Baseline Assessment). The Alaska District Credit Debit Methodology (CDM) V 1.0 was used for determination of credits for this preservation project (USACE 2016).

10.2.1. Determination of Assessment Areas

AKWAM Functional Capacity Index (FCI) scores were assigned to wetlands based on the wetland functional classes identified in the Baseline Assessment, grouped by HGM class into AAs. The AAs were grouped by HGM class rather than separated geographically by hydrologic divisions because the wetland system on the CEEMB is an almost contiguous mosaic of multiple wetland types, with very few defined breaks in hydrologic flow. AKWAM states that AAs can consist of multiple Cowardin classes, but each AA must be of a single HGM class. The existing wetlands and waterbodies on the CEEMB, as defined by the wetland functional types, were grouped into seven AAs (Table 2). Three wetland types were grouped in AA1 -Palustrine Flats, and two wetland types were grouped into AA2 – Palustrine Depressional. The small areas of riverine wetlands adjacent to an estuary or serving as outlets to the large lakes were placed in their own group, AA3; these areas were designated as palustrine flats or depressional wetlands in the Baseline Assessment, but they were revaluated based on best professional judgement for the CEEMB. AA4 represents the small palustrine ponds scattered throughout the property as a distinct aquatic resource. The small estuaries (one adjacent to AA3 in the northwest and one on the Elson Lagoon in the east) were evaluated as an aquatic resource separately (AA5). Several small areas of lacustrine fringe adjacent to small palustrine pond or lakes were evaluated as AA6. The large lakes (class L1UBH) are adjacent to some of the other AAs; the lakes were not scored using AKWAM, but they are considered AA7 for waterbody evaluation.

The extent of each AA, as defined by AKWAM guidance, may extend beyond the boundaries of the site, in order to evaluate wetland functions in larger wetland complexes and in relation to adjacent waterbodies. The extent of AAs is defined as the area within the project boundary, plus the contiguous up/downstream wetland area to the point of significant hydrologic change or 1000 feet, whichever is closer. For the AAs in the CEEMB, AA3, AA4, AA5, AA6, and AA7 are clearly defined hydrologically. AA1 and AA2 extend beyond the boundary of the project site (off-site area not depicted in Figure 3); large waterbodies define the boundaries on the north and east (Elson Lagoon), the southeast (Mayoeak River), and the northwest (Ikpik Slough). To the southwest of the project boundary, there are no significant hydrologic changes within 1000 feet of the project area, so AA1 and AA2 include all wetlands of the same type within a 1000-foot buffer around the project area. In addition to the wetland areas that extend outside the project boundary, wetlands AAs may include contiguous waterbodies. For the AAs on the CEEMB, AA-3 and AA-6 incorporate open water in their wetland assessments (but not in acreage calculations used for credit production); the waterbody portions are also scored separately as AA4, AA5, and AA7.

Baseline Assessment Wetland Functional Type	Cowardin Class	Acres on the CEEMB	Assessment Area	AA Acres On- Site (On-Site + Off-Site or Waterbody)
Seasonally Flooded-Saturated Graminoid Meadow	PEM1E	583.90	AA1 – Palustrine	1192.87
Saturated Salt-killed Meadow	PEM1S	3.70	Flats	(1400)
Saturated Graminoid Meadow	PEM1B	605.28		

Table 2: Assessment Areas by Wetland Functional Type and Cowardin Class

Semipermanently Flooded Wet Graminoid Meadow	PEM1F	231.21	AA2 – Palustrine	302.79
Wet Graminoid Meadow and Shallow Open Water Complex	PEM1F	97.42	Depressional	(307.26)
Riverine Intermittent Vegetated Streambed	R4SB7	13.87	AA3 – Riverine	13.87 (650)
Palustrine Ponds	PUBH	28.19	AA4 – Palustrine Ponds	28.19 (28.19)
Estuarine Waters	E2USP	3.90	AA5 - Estuarine	3.90 (3.90)
Lacustrine Fringe Graminoid Marsh	PEM1H	3.37	AA6 – Lacustrine Fringe	3.37 (37.35)
Open Water Lakes	L1UBH	723.35	AA7- Lakes	723.35 (723.35)

10.2.2. Wetland Functional Assessment

This evaluation used the Baseline Assessment, best professional judgment, and input from the USACE to perform a functional assessment of aquatic resources within the CEEMB. The Baseline Assessment assessed similar functions to those evaluated in AKWAM, so that method was used to translate the findings of the Baseline Assessment into a defined scoring system by wetland functional class. AKWAM assesses up to ten wetland functions for each AA. Within each of the ten functions, AKWAM calculates a 'Functional Capacity Index' used to determine the 'Actual Functional' scores, which range from 0.0 to 1.0. After all ten wetland functions are scored (or omitted as not applicable), the final result is the 'Percentage of Possible Scores,' which is the sum of the 'Actual Functional Points' divided by the sum of the 'Possible Functional Points'; the final percentage is expressed as a value ranging between 0.0 and 1.0. The 'Percentage of Possible Scores' (PPS) is comparable to similar indices used in other Alaska-specific functional assessment methodologies.

The supporting AKWAM wetland and waterbody evaluation forms are included as Appendix B. Table 3 presents a summary of the AKWAM function and service summary and overall rating for each AA. AA7, which consists of open water lakes, has a waterbody assessment form completed, but it does not have any AKWAM scores.

Assessment Area	Actual Functional Points								
Functions and Services	AA1 Palustrine Flats	AA2 Palustrine Depressional	AA3 Riverine	AA4 Palustrine Ponds	AA5 Estuarine Waters	AA6 Lacustrine Fringe	AA7 Lakes		
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	1	1	1	1	0.7	0.9	Not Assessed for Credits. No wetland		
B. General Wildlife Support	0.9	0.9	1	0.9	0.9	1	component		

Table 3: AKWAM Function and Service Summary for the CEEMB Assessment Areas

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C. General Fish Support	N/A	0.7	0.6	0.6	0.6	0.6	
D. Water Storage	0.6	0.9	0.8	N/A	N/A	0.7	
E. Sediment/ Nutrient/Toxicant Removal	1	1	0.6	0.5	0.5	0.7	
F. Sediment/ Shoreline Stabilization	N/A	N/A	0.3	N/A	N/A	0.7	
G. Production Export/ Food Chain Support	0.7	0.7	1	0.9	0.6	0.7	
H. Groundwater Discharge Recharge	N/A	N/A	N/A	N/A	N/A	N/A	
I. Uniqueness	0.4	0.4	0.7	0.4	0.7	0.7	
J. Recreation/ Education Potential (bonus points)	0.15	0.15	0.15	0.15	0.15	0.15	
Total Actual Functional Points	4.75	5.75	6.15	4.45	4.15	6.15	
Total Possible Functional Points	6	7	8	6	6	8	
Percent of Possible (PPS)	0.79	0.82	0.69	0.74	0.69	0.69	

10.2.3. Credit Calculation

The first step in calculating credits is determining the difference between wetland functions in a "With Preservation" or "Without Preservation" site condition.

Δ = With Preservation – Without Preservation

Credits would be produced from the preservation and maintenance of the CEEMB. In a "With Preservation" condition, undisturbed wetlands and waterbodies and their current functions would be preserved if the property is preserved in perpetuity, subject to an approved mitigation plan. The wetland functions are maintained; Tables 4 and 5 list the current functional capacity assigned to the wetland AAs.

In a "Without Preservation" condition, wetlands and waterbodies would be unprotected, resulting in likely loss of function resulting from threats to the property should this mitigation bank not be established, and the property is not preserved. Should unchecked scientific research be allowed to continue, there would be a permanent change of the existing wetland and waterbody system as a result of constructing long-term data collection installations, including constructing power sources for those installations, creation of miles of boardwalk or hardened trails, construction of additional access roads, manipulation of aquatic resources including potential thawing and draining of permafrost and/or waterbodies, and manipulation of wildlife habitat including potential addition of hazardous or harmful substances as well as habitat exclosures. Historical research projects provide a list of potential impacts, but there is no way to tell how damaging projects may be in the future. Large-scale tools for tundra-cutting, weather manipulation, and other purposes may produce impacts which are impossible to foresee. Construction of additional

roadways or seasonal trails may bring additional development to the CEEMB, potentially including oil and gas development and associated infrastructure, barge landing, and/or military installations. Due to the potential for large scale thaw, drainage, or addition of hazardous substances to the landscape, it is reasonable to assume all aquatic resource functions within the site would be lost and aquatic resources outside of the site boundaries would be impacted if the CEEMB site is not protected.

If the CEEMB site is not protected, then it is assumed that there will be a total loss of function provided by 1570.83 acres of wetlands contained on site. The establishment of a protected mitigation bank will effectively eliminate these threats to the site. Therefore, a reasonable wetland functional assessment would conclude that the difference between "with preservation" and "without preservation" equals the current functional values of aquatic resources on the CEEMB.

Functional values were assigned to resource types using the AKWAM PPS, described above. The AAs (Appendix B) used in the assessment were based on grouping the wetland functional classes from the Baseline Assessment by HGM class, with the addition of riverine wetland types (Table 2).

The second step in credit calculation is the following equation:

Preservation Adjustment Factor (PAF) = Threat (T) + Ecological Significance (ES)

The PAF incorporates a Threat component and an Ecological Significance component. For the Threat component, the CEEMB has a demonstrated land use trend that threatens the site, as discussed in Section 9 of the prospectus document. The site has a Master Plan approved by the NSB Planning Commission which includes a new access point, as well as the ongoing pressure of annual research. A Threat component of 0.3 was assigned because the site contains demonstrated land use trend within UIC corporate boundaries, and it is zoned as a scientific research district within the NSB.

The CEEMB contains the following attributes relevant to Ecological Significance:

(0.1) Aquatic resources that are adjacent to or connect regionally important publicly held lands, such as: National Marine Sanctuaries, National Seashores, National and State Parks, Forests, Refuges and Wildlife Management Areas. <u>√</u>

The community of Utqiaġvik is located adjacent to the NPR-A, approximately 250 miles west of the Arctic National Wildlife Refuge (Arctic Refuge), and approximately 205 miles north of the Gates of the Arctic National Park and the Noatak National Preserve. Across Elson Lagoon from the CEEMB lies the Birnirk National Historic Landmark, also known as Pigniq. The landmark is composed of 19 mounds on beach ridges made up of ancient sod houses, meat caches, and cultural debris (UAF 2016). Technology developed at this site, and other similar sites, supported rapid population expansion across the arctic regions of North America and Greenland (NPS 2018). No comprehensive archaeological study has been completed for the CEEMB, however lands around Elson Lagoon including the CEEMB may contain archaeological resources based on nearby findings. A review of the North Slope Borough's Traditional Land Use Inventory has been requested to discover any known sites.

- (0.3) Site contains aquatic resources that have been identified as significant or productive within a specified Ecoregion. Such as: Alaska's Wildlife Action Plan or Anadromous Waters Catalog, Alaska Department of Fish and Game; Aquatic Resource of National Importance.
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As detailed in Section 3.1, 69% of birds and 56% of mammals which are regularly occurring within the CEEMB have been identified in Alaska's Wildlife Action Plan as Species of Greatest Conservation Need (ADF&G 2015). These birds and mammals are reliant on the aquatic resources provided in the CEEMB for their habitat.

The adjacent Avak Creek is an anadromous waterbody listed in the Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (Anadromous Waters Catalog) (ADF&G 2018). In Avak Creek, broad whitefish, least cisco, and sockeye salmon are known to be present, all of which are categorized by ADF&G as Species of Greatest Conservation Need.

 (0.2) Aquatic resources that provide habitat important to species that have some special (Federal, State, or local) designation or importance. <u>√</u>

As detailed in Section 3.1, three of species regularly occurring within the site are listed as threatened under the ESA, including the polar bear, Steller's eider, and spectacled eider. Polar bear barrier island critical habitat exists opposite of Elson Lagoon along the Plover Islands, and within Elson Lagoon at locations south of the CEEMB.

The site is between two Important Bird Areas (IBA) as designated by Audubon Alaska, the Chukchi Sea Nearshore IBA and the Barrow Canyon and Smith Bay IBA (Audubon 2014). Steller's and spectacled eiders are also categorized as vulnerable on the International Union for the Conservation of Nature (IUCN) Red List and the NatureServe Explorer Global Status, which catalog species' risk of global extinction when evaluated by their published criteria (IUCN 2018, NatureServe 2018). Additionally, both eiders are listed on the North American Bird Conservation (NABCI)'s State of the Birds 2016 Watch List as a species of high conservation concern (NABCI 2016).

(0.1) Scarcity of Aquatic Resource Type. Such as: Specific preservation to maintain diversity of habitat type within islands systems removing the threat of habitat fragmentation for fish and wildlife species (Alexander Archipelago Islands (Southeast Alaska) Kodiak and the Aleutian Chain). X

By adding together, the assigned attribute scores for Ecological Significance (0.6) and Threat (0.3), the Preservation Adjustment Factor (PAF) is 0.9.

The third step is the following equation:

Preservation Adjusted $\Delta = (\Delta)(PAF)$

Since the PAF is 0.9, then the Preservation Adjusted Δ is 0.9 times Δ .

The fourth step is the following equation:

Adjusted Δ = Preservation Adjusted Δ / (Time Lag) (Risk)

Time Lag: The CEEMB is a preservation project and there is no Time Lag between credit releases and when the assessment has achieved a "With Preservation" functional outcome, as it is equal to the current condition. A Time Lag value of 1.0 was assigned.

Risk: A Risk score of 1.00 (*de minimis*) was assigned after considering the following factors:

- a) Plant Communities: The plant communities in the CEEMB are established, largely undisturbed, and are unlikely to change after the site is preserved.
- b) Invasive Exotic/Noxious Species: The likelihood of colonization by invasive exotic or noxious species is low because there are few recruitment sources nearby, the site has low suitability for establishment, and the functions of the plant community are not threatened, given current information.
- c) Water Quality: Degradation of site water quality is unlikely because the CEEMB is undisturbed and the surrounding land uses are largely undisturbed.
- d) Water Quantity: Changes in hydrological conditions is unlikely because the Beaufort Sea coast and local hydrology are unlikely to change because of preserving the site.
- e) Indirect Impacts: The vulnerability of the mitigation to indirect impacts is low because the aquatic resources are fairly difficult to access by the public.
- f) Direct Impacts: The vulnerability of the mitigation to direct impacts is low because aquatic resources are difficult to access by the public and the protections to be implemented on the CEEMB (i.e., management by Long-Term Steward and restrictive covenant) will effectively reduce the potential for indirect impacts.

Time Lag (1.0) multiplied by Risk (1.0) equals 1.0, resulting in an Adjusted Δ that is equal to Preservation Adjustment Δ , as displayed in Table 4. Table 5 shows the breakdown by credits by type.

Baseline Assessment Wetland Functional Type	Cowar din Class	Assessment Area	With Pres. PPS	Witho ut Pres. PPS	Δ	PAF	Adj. Δ	Acres	Credits
Seasonally Flooded- Saturated Graminoid Meadow	PEM1E								
Saturated Salt-killed Meadow	PEM1S	AA1 – Palustrine Flats	0.79	0	0.79	0.9	0.71	1192.87	846.94
Saturated Graminoid Meadow	PEM1B								
Semipermanently Flooded Wet Graminoid Meadow	PEM1F	AA2 – Palustrine	0.00	0	0.82	0.0	0.74	220.02	242.10
Wet Graminoid Meadow and Shallow Open Water Complex	PEM1F PEM1H	Depressional	0.82	0	0.82	0.9	0.74	328.63	243.19
Riverine Intermittent Vegetated Streambed	R4SB7	AA3 – Riverine	0.77	0	0.77	0.9	0.69	13.87	9.57
Palustrine Ponds	PUBH	AA4 – Palustrine Ponds	0.74	0	0.74	0.9	0.62	28.19	18.89
Estuarine Waters	E2USP	AA5 – Estuarine Waters	0.69	0	0.69	0.9	0.67	3.9	2.42
Lacustrine Fringe Graminoid Marsh	PEM1H	AA6- Lacustrine Fringe	0.77	0	0.77	0.9	0.69	3.37	2.33
	Total Aquatic Resources								1123.34

Table 4: Determination of Credits with AKWAM

Table 5: Credit Production Summary

Resource Type	Aquatic Resource Credits
Estuarine (E) Waters	2.42
Lacustrine (L)	2.33
Palustrine (P) Wetland	1521.50
Palustrine (P) Waters	18.89
Riverine (R)	9.57
Total by Resource Type	1123.34

The final step is the following equation:

Credits = (Adjusted Δ)(Acres)

Credits are determined for each resource type. The CEEMB will produce a total of 1123.34 credits (Table 5).

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Appendix A: Wetland Mapping and Aquatic Site Assessment for a Proposed Wetland Mitigation Bank in Barrow, Alaska (Baseline Assessment

WETLAND MAPPING AND AQUATIC SITE ASSESSMENT FOR A PROPOSED WETLAND MITIGATION BANK, BARROW, ALASKA

DRAFT REPORT

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INTRODUCTION

A wetlands mitigation bank is proposed for Ukpeagvik Inupiat Corporation (UIC) lands near Barrow, Alaska (Figure 1). The proposed mitigation bank lands are managed by Umiaq and occur within the boundaries of the Barrow Environmental Observatory (BEO). Comprising approximately 3,000 acres, the proposed mitigation bank lands extend along the Elson Lagoon Shoreline from Ikpik Slough to Takegakrok Point and inland south and west of Twin Lakes.

According to the U. S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA) Compensatory Mitigation Final Rule (April 10, 2008), unavoidable impacts to wetlands (debits) may be compensated for through the purchase of wetland credits from an established wetland mitigation bank. To calculate debits and credits for compensatory mitigation using a wetland mitigation bank, an aquatic site assessment (ASA) for both the impact area(s) and mitigation bank lands is recommended to compare the ecological services provided by the individual wetland and waters types in question. UIC contracted with ABR, Inc.—Environmental Research & Services (ABR) to perform an ASA for wetlands and waters within the proposed mitigation bank lands using an ASA methodology specific to the Arctic Coastal Plain (ACP) of Alaska, evaluating a range of ecological services typically provided by northern permafrost wetlands. Debits for proposed development impacts may be calculated using a similar ASA technique to the one used in this report. The UIC mitigation bank at Barrow would be eligible for mitigation on projects within the ACP.

The mitigation bank study area includes all of the proposed mitigation bank lands under consideration and is located within the Arctic Coastal Plain (ACP) ecoregion (Gallant et al. 1995) (Figure 1). The ACP is characterized by an arctic climate and is underlain by continuous permafrost. The landscape is typified by low elevations and limited topographic relief and dominated by thaw lakes and drained thaw basins oriented along the prevailing summer wind direction. Plant communities are dominated by herbaceous plants (typically grasses and sedges) and prostrate shrubs. Lakes and drained lake basins account for over 60% of the Barrow Peninsula area (Frohn et al. 2005). The centroid of the study area is 71.276308°N, 156.481041°W and the legal description is Umiat meridian, Township 22, Range 18, Section 1

and Township 22, Range 17, Sections 4, 5, 6, 7, 8, 9, 10, 16, 17 and 18. The study area is located within the Northwest Coast Watershed (HUC 19060202).

METHODS

FIELD SURVEY

A wetlands field survey of the study area was performed from 28–31 July 2015 by Susan Ives and Erin Johnson of ABR and a bear guard from UIC. Routine wetland determinations were performed following the USACE three-parameter approach (Environmental Laboratory 1987, USACE 2007), and standard wetland determination forms (USACE 2007) were completed to confirm the wetland status at each wetland determination plot. Following the USACE methods, to be classified as a wetland, a site must be dominated by hydrophytic plants, have hydric soils, and show evidence of a wetland hydrologic regime. A mobile Trimble® Nomad™ series GPS unit was used to record determination plot locations and the wetland data (using the WetForm database). WetForm is a commercially available relational database developed by Ecotone Corporation, which is used to enter wetland site data in the field and facilitate the preparation of electronic copies of the USACE regional supplement data form (USACE 2007) for each wetland determination plot. Each data form used the wetland plant indicator status per the 2014 National Wetland Plant List: Alaska (Lichvar et al. 2014). Photos of soils and vegetation were taken at each wetland determination plot. Physiographic type, surface form type, Viereck et al. (1992) Level IV vegetation class, and observations of wildlife use (e.g., dens, browse, scat) or human activity (e.g., mining, ATV trails) were also recorded at each plot. Complete data sheets are provided in Appendix A

Rapid map-verification plots also were sampled to provide ground-reference data for the mapping of wetlands. At map-verification plots, the dominant plant species, Cowardin et al. (1979) water regime, and Viereck et al. (1992) Level IV vegetation class were recorded along with site photographs and GPS locations. The data from map-verification plots were used to improve map accuracy by increasing the number of documented wetland types tagged to particular image-signatures. Verification plot summaries and photographs are provided in Appendix B.

MAPPING AND CLASSIFICATION

Wetland boundaries were visually interpreted from image signatures and were digitized onscreen using ArcGIS software, the approach typically used by the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) program (Dahl et al. 2015). Digital, highresolution imagery (color enhanced aerial imagery at a resolution of 1.64 ft acquired in 2014) was provided by UIC and used as the base image for digitizing wetlands and waters boundaries. Wetlands and waters were mapped at a scale of 1:2,000, with a minimum map unit size of 0.1 acre.

Wetlands and waters were classified following the wetlands classification of Cowardin et al. (1979), which involves classifying wetlands by dominant vegetation type and water regime. The map polygons were attributed using NWI annotation (Dahl et al. 2015). In addition to assigning Cowardin classes, each wetland polygon was assigned a physiography class, hydrogeomorphic (HGM) class, Level IV Viereck et al. (1992) vegetation class, and a microtopography class. Physiographic types represent generalized geomorphic features used to describe landscape position and function (e.g. upland, lowland, lacustrine, and riverine). HGM classes were assigned following Smith et al. (1995), and are based on geomorphic setting, water source and transport, and hydrodynamics. Level IV vegetation classes follow the Alaska Vegetation Classification System (Viereck et al. 1992), and include dominant plant species and vegetation structure. The microtopographic classes used follow the periglacial classification system developed by Washburn (1973). The five mapped variables (Cowardin wetland class, physiography class, HGM class, Level IV vegetation class, and microtopographic class) were combined to produce a set of unique land-cover types, which were then aggregated into broader ecologically related categories. For this study, we aggregated the land-cover types into wetland functional classes for descriptive and functional assessment purposes (as described in the Aquatic Site Assessment section below), and wildlife habitat classes to assess potential habitat use by birds and mammals within the study.

AQUATIC SITE ASSESSMENT

The ASA was prepared using a rapid assessment of wetland function based on HGM principles, developed in consultation with the USACE specifically for wetlands on the ACP of Alaska. The ASA method includes ACP-specific wetland function criteria and proposed

thresholds to define categorical wetland function rankings. The criteria may be evaluated using available data in the literature or site-specific field data, depending on the resources available for the project. The method is applied to Wetland Functional Classes (groups of wetland and water types that share similar ecological functions). To develop Wetland Functional Classes, we integrated information from Cowardin et al. (1979) wetland types, Viereck et al. (1992) Level IV vegetation classes, broad-scale landscape characteristics (physiography), HGM classes, and microtopographic classes. Wetland functional classes within the BEO study area were derived using data from the field observations made during the ABR wetland surveys in July 2015 (Appendix A and B).

WETLAND FUNCTIONS

Satellite imagery interpretation, local topography, and review of existing wetland maps and data for the Barrow airport were used to define the environmental conditions and characteristics for each wetland functional class and to determine indicators specific to each function. Functional classes were rated as low, moderate, or high for each wetland function, depending on the indicators present. Eight functions were evaluated as described below; the results of the analysis are presented in Appendix C.

Flood flow regulation (storage) is the capacity of a wetland to control surface-water flow and subsequently moderate downstream flooding. Snowmelt-generated floods are the dominant, maximum annual flood events in arctic watersheds (Woo 2012, McNamara et al. 1998), particularly in the low-gradient rivers and streams found on the ACP. ACP wetlands and waters are near an annual maximum for surface wetness just after snowmelt, and gradually lose water over the summer as evapotranspiration greatly exceeds precipitation (Mendez et al. 1998). Thus, flood flow regulation was assessed from the standpoint of snowmelt-generated floods, which (1) affect most communities on the ACP as sheet flow, (2) were assumed to fill any storage available in spring, and (3) occur outside (before) the growing season. Since the largest seasonal floods occur at snowmelt and wetland vegetation is largely dormant at that time, geomorphic and structural landscape characteristics are primarily responsible for floodwater retention and storage. For wetlands outside of active riverine channels, the role of polygonal features, specifically the difference between low-center polygons with ice-rich raised polygonal rims and

high- and low-center polygons with smaller steep-sided depressions (Liljedahl et al. 2012), were considered in assessing flood water storage. Surface roughness provided by live vegetation was considered if seasonal flooding from rainfall events was likely to contribute to flooding the wetland (i.e., in riverine systems).

Sediment, nutrient, and toxicant removal is the capacity of a wetland to retain suspended sediment and nutrients and/or toxicants adsorbed to inorganic sediments. The cold temperatures and shallow active (thawed) layer on the ACP limit denitrification, thus this function is assessed from the standpoint of retaining inorganic sediments and adsorption of nutrients and toxicants through settlement. Indicators of floodwater storage as described above are important indicators of this function.

Erosion control and shoreline stabilization is the degree to which a wetland reduces erosion at the edges of relatively permanent flowing waters. Dense vegetation, soil texture, and historical stability of shorelines are important indicators of this function.

Maintenance of Soil Thermal Regime can refer to a broad range of wetland soil conditions that may provide high function for a particular ecosystem. For the purposes of this ACP-specific ASA method, it refers to the degree to which a given wetland type maintains a shallow active layer and underlying permafrost throughout the growing season. Stable permafrost profiles allow for a number of valuable functions, including carbon sequestration and stability of important habitat characteristics (Putkonen 1998). This ASA gives a shallow maximum active layer a high function rating, based on indicators of function that were measured during the wetland field survey or that can be interpreted on aerial photography. It is only applicable in regions of continuous permafrost. Reliable indicators of a shallow active layer include: vegetation biomass or density, depth of organic matt, landform, waterbody type, soil moisture and aspect (Kelley et al. 2004,).

Organic matter production and export is the capacity of a wetland to make organic matter contributions to the ecosystem through primary production. Herbaceous or deciduous woody vegetation occurrence and observed depth of organic layer were principle indicators of productivity. Aerial imagery was used to assess potential export of organic matter contributions through surface-water connections and potential for flooding.

Threatened and Endangered Species (TES) Support is the capacity of a wetland or water to support threatened or endangered species. There are no threatened or endangered terrestrial mammals in the study area, and with the exception of polar bears (*Ursus maritimus*), no marine mammals occur in the study area. Polar bear habitat preferences were not assessed, however, because the primary use of terrestrial areas by polar bears in the Barrow area (with the exception of attraction to whale carcasses and possibly putrescible waste) is for maternal dens during the winter; dens are located in areas of appropriate topographic relief (e.g., bluff faces which promote deep snowdrifts) and those physical features are not associated with wetlands and waters.

Two threatened sea duck species, Steller's Eiders (*Polysticta stelleri*) and Spectacled Eiders (*Somateria fischeri*), are present in the Barrow area during the breeding season. To assess wetland support of these species, observations made in the study area and the documented use of wetland habitats (derived from other studies on the ACP) were used to develop a comprehensive understanding of the likely use of the mapped wetlands by these species. First, individual observations in the study area, as compiled by the U.S. Fish and Wildlife Service's Arctic Landscape Conservation Cooperative (ALCC 2012), were overlaid on the wetlands mapping prepared in this report to determine the occurrence of these species in individual wetland types. For this analysis, only observations of birds on the ground indicating actual use of mapped wetlands were used (i.e., flyover observations were disregarded).

Second, because many observations of threatened eiders in the study area were made in aquatic habitats with standing water and there were no records of nests, it was necessary also to assess the use of non-aquatic tundra wetlands for nesting. For this analysis, we relied first on the habitat preference information for Spectacled Eiders developed by ABR from multi-year data sets and rigorous use-versus-availability analyses in the Colville River Delta (CRD) area (Johnson et. al. 2014). While the mapped wetland habitats in the CRD studies are similar to those found on the Barrow peninsula, there are some important differences that prevent the use of the habitat-preference information for CRD wetlands directly in this study. For these reasons, we prepared a habitat-use table developed specifically for the study area to infer habitat use for the wetland types in a given Wetland Functional Class based on the documented use of those wetlands by threatened eiders in the scientific literature; this analysis was conducted using

information from the CRD work and from studies conducted in the Barrow area. The methodology for preparing the literature-based habitat-use table is described in the General avian/mammal habitat suitability section below.

General avian/mammal habitat suitability is the capacity of a wetland to support a diversity of wildlife species. This function was assessed from both a local and a regional perspective, relying on regional-scale wetlands mapping and a local-scale assessment of wildlife habitat use. The local-scale assessment of wildlife habitat use was prepared using 3 sources of information: (1) observations of wildlife species in the study area made by the ABR field crew for this study in July 2015; (2) the scientific literature, emphasizing studies in the CRD and Barrow areas, that documents the use of particular wetland habitats; and (3) communication with U.S. Fish and Wildlife Service staff who conduct bird surveys in the Barrow area. The goal was to develop a list of the bird and mammal species, including TES species, that are likely to regularly occur in the study area and to identify which wetland habitats and Wetland Functional Classes they will regularly use during some portion of their life cycle. For this assessment, Wetland Functional Classes were first crosswalked to recognizable wildlife habitat types described in the literature sources used (see below). The data sources above then were used to designate the habitats mapped in this study as important (regularly used at some point in the life cycle, e.g., for breeding, denning, migration) or not important (infrequently used or avoided completely). The literature used included the habitat-preference information for the CRD from Johnson et al. (2014), and observations made in the Barrow area during systematic wildlife surveys conducted between 2004 and 2008 (Parrett and Johnson 2004; Cyr and Johnson 2005: Attanas and Johnson 2006, 2007, and 2008). Other studies specific to the Barrow peninsula also were evaluated including work by Pitelka (1974), Johnson and Herter (1989); Larned et. al. (2006, 2012); Quakenbush et. al. (2004), and Safine (2013). For mammal species, when Barrowspecific wildlife habitat-use data were not available, we used the habitat-use information in MacDonald and Cook (2009). Based on this assessment, the list of regularly occurring wildlife species in the study area includes 35 birds and 9 mammals (Appendix D). A Wetland Functional Class was considered to have high diversity if at least half of the assessed species are expected to use the class regularly (i.e., >5 mammal species and >18 bird species).

When assessing habitat suitability at a regional scale, disproportionately high habitat use in relation to habitat availability was taken into account, as this generally reflects habitat preference. Because regional habitat mapping is not available for the Barrow area, digital NWI mapping (USFWS 2014) for palustrine, lacustrine, and riverine systems in the Northwest Coast watershed (HUC 19060202) on the ACP was used to assess the regional rarity of wetlands and waters occurring within the BEO study area. A threshold of 1% occurrence in areal coverage in the Northwest Coast watershed NWI mapping was used to define rarity of wetlands and waters and to augment the assessment of habitat suitability for birds and mammals in the study area.

Fish habitat suitability was evaluated by assessing the degree to which a wetland or water directly supports fish. Only those wetlands and waters with at least a seasonal, intermittent connection to known or likely fish-bearing waters have the potential to perform this function. Aerial imagery was used to assess the size and depth of surface waters, presence and type of vegetation, likely presence of spawning or resting areas, and connections to other waters.

Educational, scientific, recreational, or subsistence use reflects the degree to which a wetland provides direct support of hunting and gathering activities, local travel, and/or education. The study area is located entirely within the Barrow Environmental Observatory (BEO), a nearly 7,500 acre area zoned as a Scientific Research District to facilitate field research activities in a natural tundra ecosystem. The criteria used to determine if the study area is important for educational or scientific use included whether long term research sites or permanent sample plots were directly impacted. Established trails visible in aerial imagery were indicative of local travel. Opportunistic subsistence may occur as resources are available, due to the proximity of the study area to Barrow.

PROPOSED MITIGATION RANKING CATEGORIES

As part of the Section 404 permitting and wetland mitigation process, wetlands are typically categorized according to their overall functional capacity. While the final mitigation ranking categories will be determined by USACE, each wetland functional class mapped in the study area was placed into 1 of the following 3 proposed mitigation ranking categories, following the guidelines in the USACE *Ratios for Compensatory Mitigation* (USACE 2014) and the U.S. Fish

and Wildlife Service (USFWS) Part 501 FW 2 Mitigation Policy and Appendix 2 (USFWS 1993a, b).

Category I — Wetlands that: (1) provide documented habitat for threatened or endangered species; (2) represent a high quality example of a rare wetland type; (3) are rare within a given region; (4) provide habitat for very sensitive or important wildlife or plants; and/or (5) are undisturbed and contain ecological attributes that are impossible or difficult to replace within a human lifetime, if at all (USACE 2014).

For this study, a wetland functional class was given Category I status if the following ASA criteria were met: (1) contained TES preferred habitat as documented by long-term studies applicable to the study area, (2) was within an established critical habitat boundary for TES, or (3) was rated high for all evaluated functions. Long-term habitat preference studies rely on a large pool of observations, during appropriate seasons, and typically use statistical analyses to identify preferred habitats thus are considered more appropriate than single observations to determine TES use.

Category II — Wetlands that can be important for a variety of wildlife species and can be critical for the watershed depending on where they are located. In contrast to Category I wetlands, Category II wetlands do not provide critical habitat for threatened or endangered species or species of concern. Generally these wetlands are pristine, not fragmented, are common but more productive and sustain higher biodiversity compared to Category III wetlands (USACE 2014).

For this study, a wetland functional class was given Category II status if the class was rated high for 2 or more, but not all, evaluated functions.

Category III — Wetlands that are usually plentiful in the watershed, and often supporting low biodiversity. Category III wetlands are not rare or unique, and overall productivity and species diversity are relatively low. These wetlands are affected by human activities, or by fire or other natural events, and are not considered to be pristine. As a result, in some cases these wetlands require less than 1:1 mitigation ratios (USACE 2014).

For this study, a wetland functional class was given Category III status if the following ASA criteria were met: (1) rated high for 1 or fewer functions, or (2) if disturbed, the wetlands in the

functional class were degraded to the point of substantially altering original functions without providing new functions.

RESULTS AND DISCUSSION

WETLANDS AND WATERS TYPES

Three small Estuarine Intertidal Irregularly Flooded Unconsolidated Shore (E2USP) features were mapped immediately adjacent to the nearshore marine waters of Elson Lagoon, Ikpik Slough, and the mouth of the Mayoeak River. This wetland type is represented by plot BEO-30. At the time of the field survey, none of the E2USP waters had a direct surface water connection to the nearshore marine waters, but EC values were out of range of the meter used $(> 20,000 \ \mu\text{S/cm})$, indicating the salt concentration of the water exceeds that of freshwater (Riverine and Palustrine) systems. Waters are saline with an irregularly flooded regime receiving salt water input during storm surges. Lacustrine Limnetic Permanently Flooded Unconsolidated Bottom lakes (L1UBH), documented at plot BEO-33, occur throughout the study area and include East Twin Lake, West Twin Lake and 2 smaller unnamed lakes. Fresh open water accounts for approximately 25% of the BEO study area (Table 1). The study area contains one recently tapped and drained lake and coastal erosion is being monitored at the north end of East Twin Lake where the lake may be breached. Palustrine Permanently Flooded Unconsolidated Bottom Ponds (PUBH, <20acres in area) occur throughout the BEO study area and are represented at plot BEO-02. PUBH is largely a shallow open water type without islands but may have polygonised margins. Well-developed lacustrine fringes are relatively rare in open water types within this study area.

Palustrine Permanently Flooded Persistent Emergent marshes (PEM1H) account for only 0.1% of the study area (Table 1). The permanently flooded wetland code was reserved for mapping the limited number of lacustrine fringe wetlands within the study area. Represented at plot BEO-15, the plant community is dominated by Artic pendant grass (*Arctophila fulva*) and Palla's buttercup (*Ranunculus Pallasii*), with a thick floating mat of obligate wetland mosses. Soils are histosols or histic epipedons with permanent surface water.

Palustrine Semipermanently Flooded Persistent Emergent (PEM1F) wetlands account for 22.2% of the BEO study area and are a component of lowland areas surrounding lakes or within

the drained lake basin. This wetland type is most commonly a patterned feature with wetter areas occupying micro-lows. Field data collected within this type was documented via paired plots (BEO-11 and 12, BEO-06 and 07 and BEO-04 and 05) describing the moist high zones and the wet depressions separately (Appendix A). Microtopographic depressions are typically dominated by wetland obligate sedges including water sedge (*Carex aquatilis*), tall cottongrass (*Eriophorum angustifolium*), and red cottongrass (*E. russeolum*). Areas with surface water support stands of *Arctophila fulva*. The moist wetland types also support a variety of sedges and limited dwarf shrub cover including tealeaf willow (*Salix pulchra*), oval-leaf willow (*S. ovalifolia*) and least willow (*S. rotundifolia*). Soils are typically histic epipedons with a high water table and saturation to the surface. Palustrine Seasonally Flooded/Saturated Persistent Emergent meadow (PEM1E) accounts for 22.5% of the BEO study area and has a plant community composition very similar to that of PEM1F, with wet micro-low and more mesic micro-high zones. PEM1E was differentiated from PEM1F through aerial photo interpretation; it has less surface water visible in the imagery.

Palustrine Semipermanently Flooded Tidal Persistent Emergent (PEM1T) and Palustrine Temporary-Tidal Persistent Emergent (PEM1S) wetlands included 2 tidally influenced freshwater types identified during the field survey; together they account for less than 2% of the study area (Table 1). PEM1T wetlands occurred within narrow drainage features directly connecting to E2USP tidal guts. Described in plot BEO-31, these drainage features support a variety of typical salt tolerate emergent vegetation, including Fisher's tundragrass (Dupontia *fisheri*), creeping alkaligrass (*Puccinellia phryganodes*), and saltmarsh starwort (*Stellaria humifusa*). These communities have brackish EC levels (1,800 µS/cm). Soils are gleyed silty clay loams meeting the Alaska Gleyed without Hue 5Y or redder underlying indicator. Saturation is at the surface and the water table is near surface. PEM1S was described at plot BEO-23 and occurs on the raised coastline of the study area. Raised polygon centers within the PEM1S type have damage due to saltwater inputs during storm surge events. Nevertheless, low lying areas within this community type still support a healthy emergent vegetation mat that includes scurvygrass (Cochlearia officinalis), Eriophorum angustifolium, northern woodrush (Luzula confusa), Dupontia fisheri, and Arctophila fulva. PEM1S usually occurs on raised convex banks that support moist wetland communities. Histic epipedons are a common hydric soil type.

Primary hydrologic indicators (e.g., saturation) were absent at the time of sampling but the secondary hydrology indicators shallow active layer (shallow aquitard) and FAC neutral test were present.

Palustrine Saturated Persistent Emergent meadow (PEM1B) was the most dominant (26.9%) wetland type mapped in the BEO study area (Table 1). This wetland was typically associated with raised convex slope features occurring on banks along the coast or along the margins of lake basins. The plant communities are dominated by a variety of emergent species including Arctic sweet coltsfoot (*Petasites frigidus*), Arctic woodrush (*Luzula nivalis*), *Carex aquatilis*, *Eriophorum angustifolium*, and *L. confusa*. The dwarf shrub *Salix rotundifolia* is occasionally codominant. The hydric soil indicators Alaska Redox and positive reaction to alpha, alpha-dipyridol were present and saturation was observed within the top 12 inches of the soil profile.

AQUATIC SITE ASSESSMENT

WETLAND FUNCTIONS

The 9 mapped NWI wetland and waters types were aggregated into 9 ecologically similar Wetland Functional Classes according to the scheme outlined in Table 2. Individual NWI wetland types mostly corresponded to individual Wetland Functional Classes but in some cases, NWI types were combined within similar HGM types to better represent the range of functions. Wetland Functional Class descriptions including plot specific data obtained during the field survey and indicators visible in aerial photography are included in Table 2.

Lakes and Ponds, Wet Graminoid Meadow and Open Water Complex, Semipermanently Flooded Tidal Wet Graminoid Meadow and Seasonally Flooded-Saturated Graminoid Meadow all rated high for flood flow regulation, primarily due to the floodwater storage capacity provided by available depressional features and in some cases, the presence of thick emergent vegetation. Saturated Salt-killed Meadow and Saturated Graminoid Meadow occupy raised convex topographic features, with relatively few microtopographic lows that provide water storage. Thus, this Wetland Functional Class rated low for flood flow regulation (Table 3).

A majority of the Wetland Functional Classes rated high value for sediment nutrient and toxicant removal, with the exception of Saturated Salt-killed Meadow and Saturated Graminoid Meadow (Table 3). Waters classes (Estuarine Waters and Lakes and Ponds) (Table 2) rate high

because of the presence of still or slow moving water and observed evidence of sedimentation. The Wetland Functional Classes that have significant water/vegetation interspersion, the presence of slow moving or standing water, and relatively thick surface organic horizons rated high because these features contribute to sediment nutrient and toxicant removal.

Erosion control and shoreline stabilization was only assessed for Lacustrine Graminoid Marsh and Semipermanently Flooded Tidal Wet Graminoid Meadow because due to landscape position, they are the only wetland types directly affected by lacustrine or seasonal tidal processes. Both wetland classes were rated high for this function (Table 3), based on the presence of dense energy absorbing vegetation and predominantly organic substrates (Appendix C). Erosion control and shoreline stabilization was only assessed at the local scale, is based on local-scale functions for wetlands routinely subject to and formed by flooding from adjacent waterbodies. Even though the BEO study area has extensive wetlands bordering nearshore marine waters, it is beyond the scope of this evaluation to address erosional forces that are largely driven by global or regional indicators, such as the thawing of permafrost, sea level rise, or global climatic changes.

Maintenance of soil thermal regime was added as a function for this assessment to identify wetlands in the study area that are important for maintaining permafrost. As expected, waters and lacustrine fringe wetlands (Estuarine Waters, Lakes and Ponds and Lacustrine Fringe Graminoid Marsh) rated as low value (Table 3) as substantial thaw bulbs tend to develop beneath these features (Brosten 2006, Jorgenson and Shur 2007). Saturated Salt-killed Meadow also rated as low value for this function because as a result of storm surges, the insulating vegetation mat and underlying organic soil of this type have been disturbed and are no longer as effective in protecting the underlying permafrost as similarly undisturbed habitats. Saturated Graminoid Meadow was the only wetland class rated as high because it supports dense vegetation, a relatively thick organic mat, and a saturated hydrology, which slows the rate at which heat can penetrate the soil. The remaining wetland types rated as moderate due to varying degrees of flooding; water is an affective conductor of heat.

Organic matter production and export rated low to moderate across all wetland types (Table 3), due to the absence of riverine corridors or drainages (none were identified on the aerial photography or during the field survey) (Figure 2, Appendix A and B). Riverine wetlands

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typically rate high for this function due to the presence of a productive broadleaved deciduous plant canopy. Wetlands with the combination of seasonal flooding and vegetation/water interspersion were rated as moderate; the remaining wetlands received a low rating for this function (Table 3, Appendix C).

TES support was evaluated based on direct observations, presence of formally established critical habitat, and presence of preferred habitat as inferred from the habitat use table developed for this study. Wetland Functional Classes considered to be preferred habitat for the purposes of this study include Estuarine Waters, Lakes and Ponds, Lacustrine Fringe Graminoid Marsh, Wet Graminoid Meadow and Open Water Complex, Semipermanently Flooded Wet Graminoid Meadow (Table 3, Appendix C). No critical habitat is present within the BEO study area.

The highest ranking Wetland Functional Classes for general avian and mammal habitat suitability were Wet Graminoid Meadow and Open Water Complex, Semipermanently Flooded Wet Graminoid Meadow and Seasonally Flooded/Saturated Graminoid Meadow. The habitats have a high diversity of both mammals and birds as well as relatively high water and vegetation interspersion (Appendix C). None of the Wetland Functional Classes were considered regionally rare.

General Fish Habitat Suitability for Semipermanently Flooded Wet Graminoid Meadow, Seasonally Flooded/Saturated Graminoid Meadow, Saturated Salt-killed Meadow and Saturated Graminoid Meadow was not applicable because these wetlands were not adjacent to any fish bearing waterbodies or streams. The remaining Wetland Functional Classes ranked high on the basis of providing spawning and rearing habitat with the assumption that all wetland classes with a surface water component have the potential to support at least seasonal populations of fish.

Education/Science/Recreation and Subsistence Use was rated high value for all evaluated Wetland Functional Classes (Table 3) on the basis that the entire study area is located within an established research area (BEO), is in public ownership close to Barrow, and easily accessible by road and boat.

PROPOSED MITIGATION RANKING CATEGORIES

Using the criteria described in the Methods section of this report, 7 Wetland Functional Classes ranked as Category I, 1 ranked as Category II and 1 as Category III. Estuarine Waters, Lakes and Ponds, Lacustrine Fringe Graminoid Marsh, and Wet Graminoid Meadow and Open Water Complex, Semipermanently Flooded Wet Graminoid Meadow, Seasonally Flooded-Saturated Graminoid Meadow and Saturated Graminoid Meadow fell into Category I because they are documented as preferred habitat for either Spectacled or Steller's Eider; otherwise they would have been considered Category II wetlands due to their combination of moderate to high ratings. Semipermanently Flooded Tidal Wet Graminoid Meadow is not preferred habitat for any TES but rated high value for 3 functions and thus was ranked as Category II. Saturated Saltkilled Meadow also was given Category III status based on its low to moderate ratings across most functions.

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NWI Code ^a	NWI Name	Area (acres)	Percent of Study Area
Waters			
E2USP	Estuarine Intertidal Irregularly Flooded Unconsolidated Shore	4.59	0.2
L1UBH	Lacustrine Limnetic Permanently Flooded Unconsolidated Bottom	723.36	25.1
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	48.46	1.7
	Waters Subtotal	776.42	27.0
Wetlands			
PEM1H	Palustrine Permanently Flooded Persistent Emergent	2.77	0.1
PEM1F	Palustrine Semipermanently Flooded Persistent Emergent	641.55	22.2
PEM1T	Palustrine Semipermanently Flooded-Tidal Persistent Emergent	3.12	0.1
PEM1E	Palustrine Seasonally Flooded/Saturated Persistent Emergent	648.62	22.5
PEM1S	Palustrine Temporary-Tidal Persistent Emergent	36.40	1.3
PEM1B	Palustrine Saturated Persistent Emergent	776.85	26.9
	Wetlands Subtotal	2109.31	73.0
	Grand Total	2885.72	100.0

Table 1. Waters and wettainds within the DEO study area, Darrow, Alaska, 201	Table 1.	Waters and wetlands within the BEO study	y area, Barrow, Alaska, 2015
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^a NWI = National Wetland Inventory annotation based on Cowardin et al. (1979) classification system.

Table 2.Wetland Functional Class descriptions and crosswalk table to mapped NWI types in the BEO study area, Barrow, Alaska, 2015.

Wetland Functional Class	HGM type	NWI* type	Class Description
Estuarine Waters	Depressional	E2USP	Occurs within 3 small inlets where tidal influence was considered to be at least seasonal. Direct surface water connections to marine waters were not observed during the field survey, but based on the prevalence of salt tolerant plant species on the edges of the waterbody and an EC measurement of 20 mS/cm, these waters were classified as estuarine.
Lakes and Ponds	Depressional	L1UBH, PUBH	Lakes (>20 acres in size) and ponds occur throughout the BEO study area. Depth is unknown but overall assumed to be shallow <3m in depth.
Lacustrine Fringe Graminoid Marsh	Lacustrine Fringe	PEM1H, PEM1F	Occurs along the fringes of 2 small ponds. Vegetation types are aquatic sedge marsh or floating mats with significant moss cover. Typical graminoid species include <i>Arctophila fulva</i> , <i>Carex aquatilis</i> and <i>Eriophorum angustifolium</i> .
Wet Graminoid Meadow and Shallow Open Water Complex	Depressional	PEM1H, PEM1F	A subset of the mapped PEM1F wetland type with mixed high- and low-center polygon patterned ground features. Occurs in low-lying areas at the edges of lakes or within the drained lake basin where microtopographic low features are permanently inundated, forming small ponds too small to map individually. Plant community dominated by obligate wetland sedge species including <i>Carex</i> <i>aquatilis</i> and <i>Eriophorum angustifolium</i> . Surface water is present throughout the growing season and soils are histic epipedons.
Semipermanently Flooded Tidal WetGraminoid Meadow	Depressional	PEM1T	Mapped within 2 drainage features connected to the Estuarine Waters type described above. Dominated by salt tolerant emergent vegetation such as <i>Dupontia fisheri</i> , <i>Puccinellia phryganodes</i> and <i>Stellaria humifusa</i> . Measured EC levels indicate this wetland class is brackish. Soils are gleyed silty clay loams with a near surface water table.

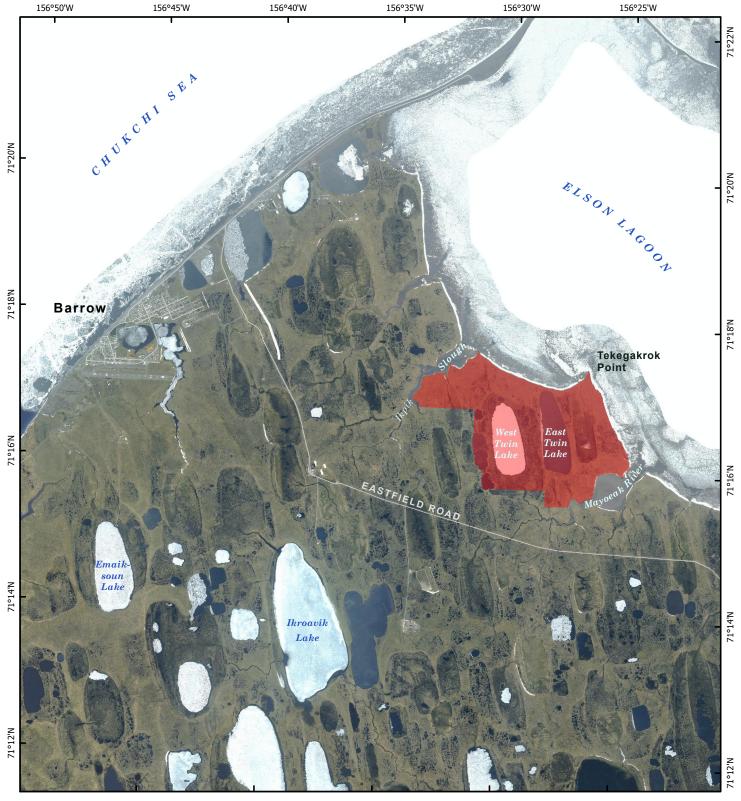
Table 2. Continued.

Wetland Functional Class	HGM type	NWI* type	Class Description
Semipermanently Flooded Wet Graminoid Meadow	Depressional	PEM1F	Typically found in lowland areas at the edges of lakes and in drained lake basins. The most common pattern ground feature are low center polygons which support obligate wet sedge plant communities. Development of small open waterbodies within degrading polygon features is not as pronounced as the Wet Sedge Meadow and Shallow Open Water Complex.
Seasonally Flooded-Saturated Graminoid Meadow	Flats	PEM1E	Mapped on Flats HGM landforms with similar plant community composition to Semipermanently Flooded Wet Graminoid Meadow with fewer open water patches throughout the class. Patterned ground feature is mixed high and low center polygons with high features supporting moist tundra types and depressions supporting wetter obligate sedge communities.
Saturated Salt-killed Meadow	Flats	PEM1S	Occurs in discrete patches on banks of marine waters where storm surge events have caused salt kill to palustrine tundra communities. High center polygon centers receive the most damage with intact moist emergent plant communities occupying the low microtopography. Soils are histic epipedons with secondary hydrology indicators present.
Saturated Graminoid Meadow	Flats	PEM1B	Occurs on raised convex topography on banks along the coast and at the edges of lake basins. Pattern ground features are high center polygons with very little standing surface water with low-lying troughs. Dominated by an emergent plant community composed of <i>Petasites frigidus, Luzula nivalis, Carex aquatilis,</i> and <i>Eriophorum</i> <i>angustifolium.</i> Dwarf shrubs including <i>Salix rotundifolia</i> may be present on raised microtopography. Soils meet Alaska Redox hydric soil indicator and saturation is within the top 12 inches of the soil profile.

* NWI = National Wetland Inventory annotation based on Cowardin et al. (1979) classification system.

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Wetland Functional Class	Category	Flood Flow Regulation	Sediment/ Nutrient/ Toxicant Removal	Erosion Control & Shoreline Stabil.	Maintenance of Soil Thermal Regime	Organic Matter Production and Export	TES Support	General Avian and Mammal Habitat Suitability	General Fish Habitat Suitability	Education/ Science/ Rec/ Subsist Use
Estuarine Waters	Ι	Moderate	High	N/A	Low	Low	Moderate	Low	High	High
Lakes and Ponds	Ι	High	High	N/A	Low	Low	High	Moderate	High	High
Lacustrine Fringe Graminoid Marsh	Ι	Moderate	High	High	Low	Moderate	Moderate	Moderate	High	High
Wet Graminoid Meadow and Open Water Complex	Ι	High	High	N/A	Moderate	Moderate	Moderate	High	High	High
Semipermanently Flooded Tidal Wet Graminoid Meadow	II	Moderate	High	Moderate	Low	Low	Low	Moderate	High	High
Semipermanently Flooded Wet Graminoid Meadow	Ι	High	High	N/A	Moderate	Moderate	High	High	N/A	High
Seasonally Flooded-Saturated Graminoid Meadow	Ι	High	High	N/A	Moderate	Moderate	High	High	N/A	High
Saturated Salt-killed Meadow	III	Low	Low	N/A	Moderate	Low	Low	Low	N/A	High
Saturated Graminoid Meadow	Ι	Low	Low	N/A	High	Low	High	Moderate	N/A	High

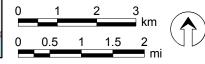
Table 3.Wetland Functional Class relative ratings and proposed mitigation ranking categories for the BEO study area, Barrow,
Alaska, 2015.

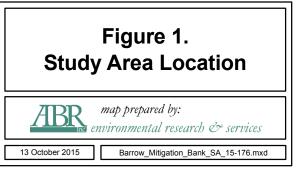


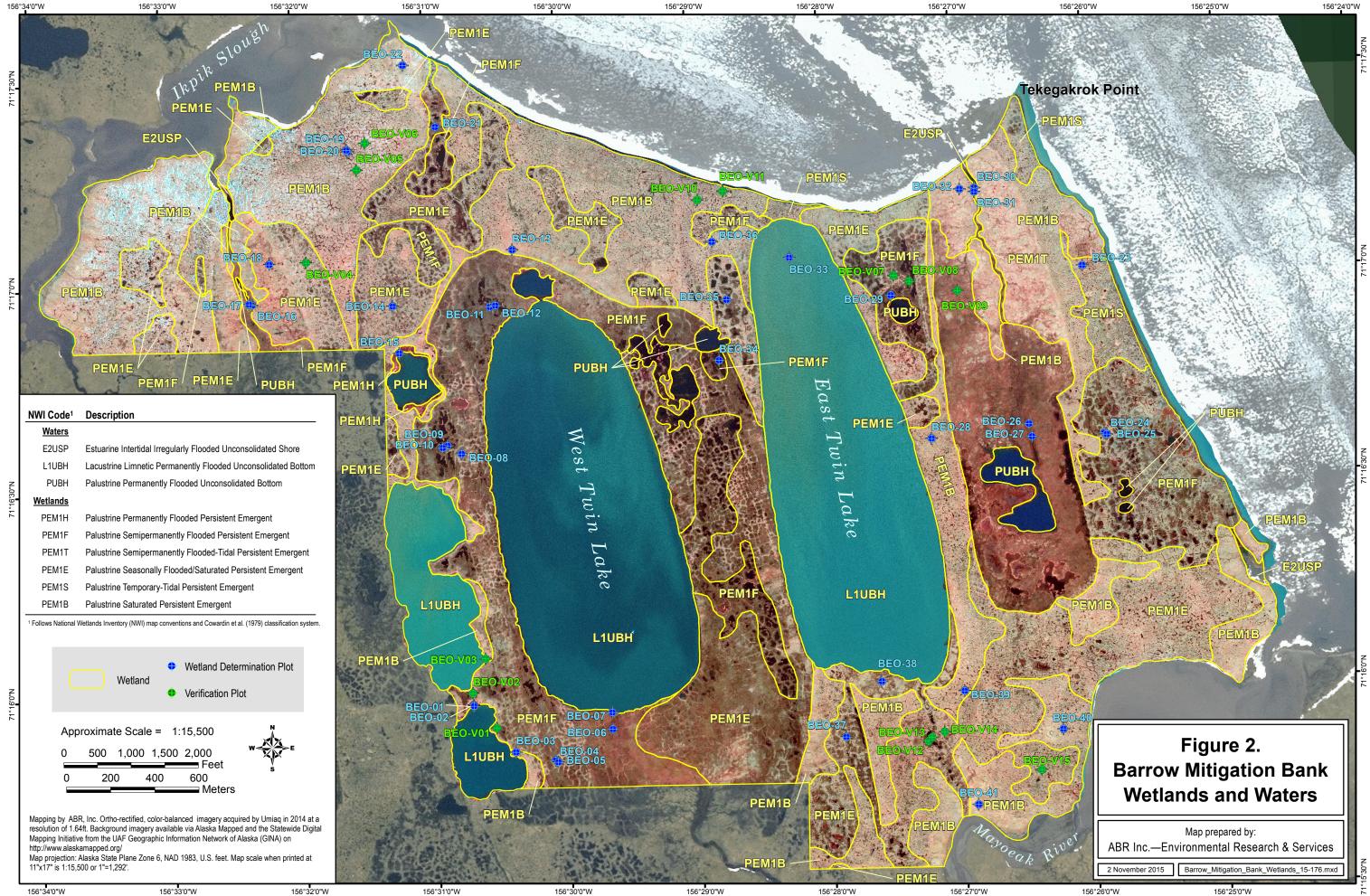




Background imagery from SPOT5 pseudonatural color, spatial resolution of 2.5m. Data obtained via the Alaska Mapped and the Statewide Digital Mapping Initiative from the UAF Geographic Information Network of Alaska (GINA) on http://www.alaskamapped.org/







156°34'0"W

Wetland Functional Class

156°33'0"\

TRPik

156°32'0"V

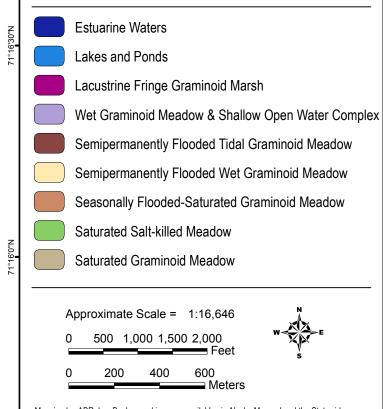
156°31'0"W

156°30'0"W

West Twin Lake

156°29'0"W

156°28'0"\



Mapping by ABR, Inc. Background imagery available via Alaska Mapped and the Statewide Digital Mapping Initiative from the UAF Geographic Information Network of Alaska (GINA) on http://www.alaskamapped.org/ Map projection: Alaska State Plane Zone 6, NAD 1983, U.S. feet. Map scale when printed at 11"x17" is 1:15,500 or 1"=1,292'.

156°32'0"W

156°31'0"W

156°30'0"W

156°29'0"W

156°28'0"W

East Twin Lake

156°27'0"W



156°24'0"W

roject/Site: Barrow Environmental Obseratory	B	orough/City:	North Slo	pe Borough Sampling Date: 28-Jul-15
oplicant/Owner: UIC				Sampling Point: BEO-01
vestigator(s): SLI, EKJ	1	Landform (hill:	side, terrac	e, hummocks etc.): Lakeshore
cal relief (concave, convex, none): concave		Slope: 0.0	% / 0.0	[°] Elevation: 10
bregion : Northern Alaska	Lat.: 7	71.26624		Long.: -156.512023333333 Datum: WGS84
I Map Unit Name:	_			NWI classification: PEM1F
e climatic/hydrologic conditions on the site typical for this	time of year?	? Yes	• No ()	
re Vegetation , Soil , or Hydrology	•		Are "N	lormal Circumstances" present? Yes No
re Vegetation, Soil, or Hydrology				ded, explain any answers in Remarks.)
JMMARY OF FINDINGS - Attach site map sh Hvdrophytic Vegetation Present? Yes No	owing sam	ping point	locations	
, , , , , , , , , , , , , , , , , , ,		ls t	he Samp	pled Area
		wit	hin a We	etland? Yes \odot No \bigcirc
Wetland Hydrology Present? Yes No Remarks: lacustrine fringe of smaller lake. water levels				
grazed arcful. fox scat. GETATION - Use scientific names of plants.	List all spe	cies in the	plot.	1
Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1	0		Status	Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
				Total Number of Dominant
2				Species Across All Strata: (B)
	•			Percent of dominant Species
5.	0			That Are OBL, FACW, or FAC:(A/B)
Total Cove	er:			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:	0 20%	of Total Cover:	0	Total % Cover of: Multiply by:
1	0			OBL Species $35.1 \times 1 = 35.1$
2.	•			FACW Species $0 \times 2 = 0$
3.				FAC Species 0 $x 3 =$ 0 FACU Species 0 $x 4 =$ 0
4.				
5.				
6	0			Column Totals: <u>35.1</u> (A) <u>35.1</u> (B)
7	0			Prevalence Index = B/A =1.000
8	0			Hydrophytic Vegetation Indicators:
9				Dominance Test is > 50%
10.	0			✓ Prevalence Index is ≤3.0
Total Cover:		of Total Cover:	0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Arctophila fulva	35	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Eriophorum scheuchzeri	0.1		OBL	¹ Indicators of hydric soil and wetland hydrology must
3	0			be present, unless disturbed or problematic.
4				
				Plot size (radius, or length x width) <u>r=5m</u>
5	0			% Cover of Wetland Bryophytes
6				(Where applicable)
6. 7.	0			% Bare Ground
6. 7. 8.	0			% Bare Ground Total Cover of Bryophytes
6. 7. 8. 9.	0 0 0			Total Cover of Bryophytes 55
6. 7. 8.	0 0 0 0			

WETLAND DETERMINATION DATA FORM - Alaska Region

Depth	Ma			Rei	lox Feat			-				
(inches)	Color (moist		%	Color (moist)	%	Type ¹	Loc 2		Texture		Rer	narks
0-1			100					Peat		fibric or	ganics	
1-6			100					Mucky Pe	eat	hemic c	organics	
6-13			100					Muck		sapric o	rganics	
	n						-	-				
	centration D-D	enletion Pl	M-Reduce	d Matrix ² Location	. DI – Dou	 e Lining PC	-Poot Cha	nnel M-I	Natriv			
ydric Soil I		ерісцоп. Кі	-Reduce	Indicators for I		-	-	1111EI. M-1				
-				Alaska Color C			50115	—				
_	r Histel (A1)					-			a Gleyed Wit Iying Layer	hout Hue 5Y	or Redder	
	pedon (A2)			Alaska Alpine						Developed (see		
	Sulfide (A4)			Alaska Redox	with 2.5Y	nue			(Explain in I	kemarks)		
_	k Surface (A12)			³ One indicator o	fhydroph	vtic vogototi	00 000 07	imany indi	cator of wor	and hydrolog	-1V	
-	eyed (A13)			and an appropria							111	
-	dox (A14)											
] Alaska Gle	eyed Pores (A15)		⁴ Give details of	color char	nge in Remai	·ks.					
	er (if present):							Line al col	e Cell Durr			
Type: fro	ost							Hydri	c Soil Pres	sent? \	(es 🖲	No 🔾
								1				
		ough wett	er areas.	Seasonal frost at	13in, un	sure if hist	el or histi	c epipedo	on.			
marks: S odor whe	en walking thr	ough wett	er areas.	Seasonal frost at	13in, un	sure if hist	el or histi	c epipedo	on.			
marks: S odor whe	en walking thr		er areas.	Seasonal frost at	13in, un	sure if hist	el or histi	c epipedo		/ Indicators	(2 or mo	re required)
marks: S odor whe 'DROLO etland Hyd	en walking three of the second s	ors:		Seasonal frost at	13in, un	sure if hist	el or histi	c epipedo	Secondary			re required)
marks: S odor whe DROLO etland Hyd	en walking three OGY Irology Indicat	ors:			·			c epipedo	Secondary	Stained Leav	/es (B9)	re required)
TOROLO	en walking three GY Irology Indicat Icators (any or Vater (A1)	ors:		Inundation 1	visible on	Aerial Image	егу (В7)	c epipedo	Secondary	Stained Leav ge Patterns (/es (B9) (B10)	
TOROLO TOROLO etland Hyd imary Indi Surface V High Wat	en walking three GY Irology Indicat icators (any or Vater (A1) ier Table (A2)	ors:		Inundation	Visible on getated C	Aerial Image	егу (В7)	c epipedo	Secondary	Stained Leav ge Patterns (ed Rhizosphe	ves (B9) (B10) eres along L	iving Roots (C3
marks: S odor whe DROLO etland Hyd imary Indi Surface V High Wat Saturatio	en walking three OGY Irology Indicat icators (any or Vater (A1) icer Table (A2) n (A3)	ors:		Inundation Sparsely Ver Marl Deposi	Visible on getated C ts (B15)	Aerial Imag	егу (В7)	c epipedo	Secondary Water Drainag Oxidize	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce	ves (B9) (B10) eres along L	iving Roots (C3
marks: S odor whe 'DROLO etland Hyd imary Indi Surface V High Wat Saturatio Water Mater	en walking thro GY Irology Indicat cators (any or Vater (A1) ter Table (A2) n (A3) arks (B1)	ors:		Inundation Sparsely Ver Marl Deposi Hydrogen St	Visible on getated C ts (B15) ulfide Odd	Aerial Imago oncave Surfa	егу (В7)	c epipedo	Secondary Water Drainag Oxidize Presenu Salt De	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce eposits (C5)	ves (B9) (B10) pres along L ed Iron (C4)	iving Roots (C3)
Marks: S odor whe DROLO etland Hyd imary Indi Surface V High Wat Saturatio Water Ma Sediment	en walking three OGY Irology Indicat Cators (any or Vater (A1) ther Table (A2) n (A3) arks (B1) the Deposits (B2)	ors:		Inundation Sparsely Ver Marl Deposi Hydrogen S Dry-Season	Visible on getated C ts (B15) ulfide Odo Water Ta	Aerial Imago oncave Surfa or (C1) ble (C2)	егу (В7)	c epipedo	Secondary Water Drainag Oxidize Present Salt De Stunted	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce eposits (C5) d or Stressed	ves (B9) (B10) eres along L ed Iron (C4) d Plants (D1	iving Roots (C3)
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Marks: Sodor whe CDROLO Petland Hyd rimary Indi Surface V High Wat Saturatio Water Ma Sediment GI Algal Mat Iron Dep Surface Water Gater Table P aturation Pre ncludes capil	en walking three PGY Irology Indicat Cators (any or Vater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) ations: Present? resent? Iary fringe)	Yes O Yes O Yes O	ient) No No No No	☐ Inundation \ Sparsely Ver Marl Deposi ✔ Hydrogen Si Dry-Season ☐ Other (Expla Depth (inc Depth (inc Depth (inc	Visible on getated C ts (B15) ulfide Odc Water Ta ain in Ren hes):	Aerial Image oncave Surfa or (C1) ble (C2) narks) 0 3 0	ery (B7) ace (B8)		Secondary Water 1 Drainag Oxidize Present Salt De Sturter Geomo Stallov Microto FAC-ne	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce posits (C5) d or Stressed rphic Positio v Aquitard (I opographic R eutral Test (I	res (B9) (B10) (B10) (B10) (B10) (C4) (C4) (C4) (C4) (C4) (C4) (C4) (C4	iving Roots (C3)) .)
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Provide a state of the stat	en walking three PGY Irology Indicat Cators (any or Vater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) ations: Present? resent? Iary fringe)	Yes O Yes O Yes O	ient) No No No No	☐ Inundation \ Sparsely Ver Marl Deposi ✔ Hydrogen Si Dry-Season ☐ Other (Expla Depth (inc Depth (inc Depth (inc	Visible on getated C ts (B15) ulfide Odc Water Ta ain in Ren hes):	Aerial Image oncave Surfa or (C1) ble (C2) narks) 0 3 0	ery (B7) ace (B8)		Secondary Water 1 Drainag Oxidize Present Salt De Sturter Geomo Stallov Microto FAC-ne	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce posits (C5) d or Stressed rphic Positio v Aquitard (I opographic R eutral Test (I	res (B9) (B10) (B10) (B10) (B10) (C4) (C4) (C4) (C4) (C4) (C4) (C4) (C4	iving Roots (C3)) .)
Primary Indi Primary Indi Surface V Primary Indi Surface S Primary	en walking three Inclogy Indicate (actors (any or Vater (A1) (art Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) c or Crust (B4) osits (B5) Soil Cracks (B6) ations: Present? resent? resent? sent? lary fringe) ta (stream gate ta (stream gate)	Yes O Yes O Yes O Yes O Yes O	ient) No No No Sor well, a	☐ Inundation \ Sparsely Ver Marl Deposi ✔ Hydrogen Si Dry-Season ☐ Other (Expla Depth (inc Depth (inc Depth (inc	Visible on getated C ts (B15) ulfide Odc Water Ta ain in Rem thes):	Aerial Imagoncave Surfator (C1) ble (C2) harks)	ery (B7) ace (B8)		Secondary Water 1 Drainag Oxidize Present Salt De Sturter Geomo Stallov Microto FAC-ne	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce posits (C5) d or Stressed rphic Positio v Aquitard (I opographic R eutral Test (I	res (B9) (B10) (B10) (B10) (B10) (C4) (C4) (C4) (C4) (C4) (C4) (C4) (C4	iving Roots (C3)) .)
Provide a state of the stat	en walking three Inclogy Indicate (actors (any or Vater (A1) (art Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) c or Crust (B4) osits (B5) Soil Cracks (B6) ations: Present? resent? resent? sent? lary fringe) ta (stream gate ta (stream gate)	Yes O Yes O Yes O Yes O Yes O	ient) No No No Sor well, a	☐ Inundation \ Sparsely Ver Marl Deposi ✔ Hydrogen Si Dry-Season ○ Other (Expla Depth (inc Depth (inc Depth (inc Depth (inc	Visible on getated C ts (B15) ulfide Odc Water Ta ain in Rem thes):	Aerial Imagoncave Surfator (C1) ble (C2) harks)	ery (B7) ace (B8)		Secondary Water 1 Drainag Oxidize Present Salt De Sturter Geomo Stallov Microto FAC-ne	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce posits (C5) d or Stressed rphic Positio v Aquitard (I opographic R eutral Test (I	res (B9) (B10) (B10) (B10) (B10) (C4) (C4) (C4) (C4) (C4) (C4) (C4) (C4	iving Roots (C3)) .)
YDROLO YDROLO YDROLO YDROLO Yetland Hyd rimary Indi Surface V High Wate Y High Wate Y High Wate W Saturation Water Mater Table P Surface Water Table P Surface Mater Table P Mater Mater Table P<!--</b-->	en walking three Inclogy Indicate (actors (any or Vater (A1) (art Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) c or Crust (B4) osits (B5) Soil Cracks (B6) ations: Present? resent? resent? sent? lary fringe) ta (stream gate ta (stream gate)	Yes O Yes O Yes O Yes O Yes O	ient) No No No Sor well, a	☐ Inundation \ Sparsely Ver Marl Deposi ✔ Hydrogen Si Dry-Season ○ Other (Expla Depth (inc Depth (inc Depth (inc Depth (inc	Visible on getated C ts (B15) ulfide Odc Water Ta ain in Rem thes):	Aerial Imagoncave Surfator (C1) ble (C2) harks)	ery (B7) ace (B8)		Secondary Water 1 Drainag Oxidize Present Salt De Sturter Geomo Stallov Microto FAC-ne	Stained Leav ge Patterns (ed Rhizosphe ce of Reduce posits (C5) d or Stressed rphic Positio v Aquitard (I opographic R eutral Test (I	res (B9) (B10) (B10) (B10) (B10) (C4) (C4) (C4) (C4) (C4) (C4) (C4) (C4	iving Roots (C3)) .)

BEO-01

Wetland Functional Class: Lacustrine Fringe Graminoid Marsh Wildlife Habitat: Aquatic Graminoid Marsh



Hydric Soil Indicators: Histic Epipedon (A2), Hydrogen Sulfide (A4). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Hydrogen Sulfide Odor (C1).



PEM1F

roject/Site: Barrow Environmental Obseratory	B	orough/City:	North Slo	pe Borough Sampling Date: 28-Jul-15
pplicant/Owner: UIC				Sampling Point: BEO-02
vestigator(s): SLI, EKJ		Landform (hill	side, terrac	ce, hummocks etc.): Pond
ocal relief (concave, convex, none): concave		Slope: 0.0	%/ 0.0	D° Elevation: 10
bregion : Northern Alaska	Lat.:	71.266163333	33333	Long.: -156.5120066666667 Datum: WGS84
il Map Unit Name:	_			NWI classification: PUBH
e climatic/hydrologic conditions on the site typical for this	ime of vear	7 Yes	• No ()	
		disturbed?		Normal Circumstances" present? Yes \bigcirc No \bigcirc
	naturally pr			eded, explain any answers in Remarks.)
JMMARY OF FINDINGS - Attach site map sho	wing sam	ipling point	locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		ls	the Sam	pled Area
Hydric Soil Present? Yes No			thin a We	
Wetland Hydrology Present? Yes $oldsymbol{O}$ No $igodoldsymbol{O}$				
Remarks: Lacustrine pond at edge of study area. no islar by BEO-01. No obvious inlets/outlets. several c EGETATION - Use scientific names of plants. L	lunlin observ	ved on pond.		
I	Absolute	Dominant	•	Dominance Test worksheet:
Tree Stratum	% Cover	Species?	Status	Number of Dominant Species
1.				That are OBL, FACW, or FAC:(A)
2				Total Number of Dominant Species Across All Strata: 0 (B)
3				Percent of dominant Species
4.				That Are OBL, FACW, or FAC: 0.0% (A/B)
5				Prevalence Index worksheet:
Total Cove				Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover:	0 20%	of Total Cover:	0	OBL Species $0 \times 1 = 0$
1				FACW Species $0 \times 2 = 0$
2				FAC Species $0 \times 3 = 0$
3				FACU Species $0 \times 4 = 0$
4.				UPL Species 0 x 5 = 0
5				Column Totals: <u>0</u> (A) <u>0</u> (B)
6.				
7				Prevalence Index = B/A =0.000
8 9.				Hydrophytic Vegetation Indicators:
9 10				Dominance Test is > 50%
Total Cove	 r: 0			Prevalence Index is ≤3.0
_Herb Stratum50% of Total Cover:		of Total Cover	:	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1				Problematic Hydrophytic Vegetation ¹ (Explain)
2				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3				De present, uniess disturbed of problematic.
4				
5				Plot size (radius, or length x width)
6				% Cover of Wetland Bryophytes (Where applicable)
				% Bare Ground
7	0			100
8				Total Cover of Bryophytes
8 9				
8	0			Total Cover of Bryophytes Hydrophytic Vegetation Present? Yes • No O

WETLAND DETERMINATION DATA FORM - Alaska Region

Depth (inches)	Ma	trix		dicator or conf Red	orm the abs		cators)			
	Color (moist	;)%	Color (r	noist)	_%_	1	_Loc_2		e	Remarks
Type: C=Co	ncentration. D=D	epletion. RM=						annel. M=Matrix		
_	Indicators:			ators for P			Soils ³ :	_		
	or Histel (A1)			ska Color Ch					ed Without Hue 5	Y or Redder
	ipedon (A2)			ska Alpine s				Underlying	-	
	n Sulfide (A4)			ska Redox V	vith 2.5Y	пие		✓ Other (Expl	an in kemarks)	
	rk Surface (A12)		3 One	indicator of	hydrophy	tic vegetat	ion, one pr	rimary indicator of	of wetland hydrol	oav.
	leyed (A13) edox (A14)		and a	n appropriat	e landsca	pe position	n must be p	present.		5
	leyed Pores (A15))	⁴ Give	details of c	olor chan	ge in Rema	arks.			
Type: Depth (ind emarks:	ches): pond, assume	hudric coil						Hydric Soi		Yes 🔍 No 🔾
nvegetateu	pond, assume									
YDROLO								_Secc	ndary Indicator	rs (2 or more required)
YDROLO Vetland Hyd Primary Ind	DGY drology Indicat licators (any on	ors:						\	Vater Stained Lea	aves (B9)
YDROLC Vetland Hyr Primary Ind Surface	DGY drology Indicat licators (any on Water (A1)	ors:	[] I	nundation V		-			Vater Stained Lea Drainage Patterns	aves (B9) 5 (B10)
YDROLO Vetland Hyu Primary Ind Surface High Wa	DGY drology Indicat licators (any on Water (A1) uter Table (A2)	ors:		parsely Veg	etated Co	-			Vater Stained Lea Drainage Patterns Dxidized Rhizosph	aves (B9) ; (B10) neres along Living Roots (C3)
YDROLC Vetland Hyu Primary Ind ✓ Surface High Wa Saturatio	DGY drology Indicat licators (any on Water (A1) uter Table (A2) on (A3)	ors:	נ פ ו	parsely Veg Iarl Deposits	etated Co 5 (B15)	oncave Surf			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Redu	aves (B9) 5 (B10) neres along Living Roots (C3) ced Iron (C4)
YDROLC Vetland Hyd Primary Ind ✓ Surface High Wa Saturatic Water M	DGY drology Indicat licators (any on Water (A1) uter Table (A2) on (A3) larks (B1)	ors:	נ פ ו ו	iparsely Veg 1arl Deposits lydrogen Su	etated Co s (B15) lfide Odor	oncave Surf r (C1)		V111	Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Galt Deposits (C5)	aves (B9) 5 (B10) neres along Living Roots (C3) ced Iron (C4)
YDROLC Vetland Hyd Primary Ind ✓ Surface High Wa Saturatio Water M Sedimer	DGY drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) it Deposits (B2)	ors:		Sparsely Veg 1arl Deposits 1ydrogen Su Dry-Season V	etated Co s (B15) Ifide Odo Vater Tab	oncave Surf r (C1) ble (C2)			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresso	aves (B9) s (B10) heres along Living Roots (C3) ced Iron (C4) ed Plants (D1)
YDROLC Vetland Hyd Primary Ind ✓ Surface High Wa Saturatio Water M Sedimer □ Drift dep	DGY drology Indicat licators (any on Water (A1) uter Table (A2) on (A3) larks (B1)	ors:		iparsely Veg 1arl Deposits lydrogen Su	etated Co s (B15) Ifide Odo Vater Tab	oncave Surf r (C1) ble (C2)			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Galt Deposits (C5)	aves (B9) ; (B10) neres along Living Roots (C3) ced Iron (C4) ed Plants (D1) ion (D2)
YDROLC Vetland Hyp Primary Ind Saurface High Wa Saturatid Water M Sedimer Drift dep Algal Ma	DGY drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3)	ors:		Sparsely Veg 1arl Deposits 1ydrogen Su Dry-Season V	etated Co s (B15) Ifide Odo Vater Tab	oncave Surf r (C1) ble (C2)			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Galt Deposits (C5) Stunted or Stresse Geomorphic Positi	aves (B9) (B10) eres along Living Roots (C3) ced Iron (C4) ed Plants (D1) ion (D2) (D3)
YDROLC Vetland Hyp Primarv Ind ✓ Surface High Wa Saturatic Water M Sedimer Drift dep Algal Ma Iron Dep	DGY drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) th Deposits (B2) posits (B3) th or Crust (B4)	ors:		Sparsely Veg 1arl Deposits 1ydrogen Su Dry-Season V	etated Co s (B15) Ifide Odo Vater Tab	oncave Surf r (C1) ble (C2)			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresse Geomorphic Positi Shallow Aquitard	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ed Plants (D1) ion (D2) (D3) Relief (D4)
YDROLC Vetland Hyd Primary Ind ✓ Surface High Wa Saturatic Water M Sedimer Drift dep Orift dep Algal Ma Iron Dep Surface Surface	DGY drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) ht Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) vations:	ors: e is sufficier		parsely Veg Iarl Deposit: Iydrogen Su Dry-Season V Dther (Explai	etated Co 5 (B15) Ifide Odo Vater Tab n in Rem	ncave Surf r (C1) ble (C2) arks)			Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Galt Deposits (C5) Gtunted or Stresse Geomorphic Positi Ghallow Aquitard Aicrotopographic	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ed Plants (D1) ion (D2) (D3) Relief (D4)
YDROLC Vetland Hyp Primary Ind ✓ Surface High Wa Saturatio Saturatio Water M Sedimer Drift dep Algal Ma Iron Dep Surface Surface Water	DGY drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) vations: ar Present?	ors: e is sufficier Yes •	1 2 7 7 7 7 7 7 7 7 7 7	Sparsely Veg 1arl Deposits 1ydrogen Su Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tab n in Rem	oncave Surf r (C1) ble (C2)	ace (B8)		Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresse Geomorphic Positi Shallow Aquitard Aicrotopographic SAC-neutral Test	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ded Plants (D1) ion (D2) (D3) Relief (D4) (D5)
YDROLC Vetland Hyp Primary Ind ✓ Surface High Wa Saturatid Saturatid Sedimer Drift dep Algal Ma Iron Dep Surface Surface Water Vater Table I	DGY drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) tt Deposits (B2) posits (B3) tt or Crust (B4) posits (B5) Soil Cracks (B6) vations: rr Present? Present?	ors: e is sufficier Yes Yes Yes	1 2 9 2 1 1 1 1	parsely Veg Iarl Deposit: Iydrogen Su Dry-Season V Dther (Explai	etated Co s (B15) Ifide Odoi Vater Tab n in Rem	ncave Surf r (C1) ble (C2) arks)	ace (B8)		Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresse Geomorphic Positi Shallow Aquitard Aicrotopographic SAC-neutral Test	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ed Plants (D1) ion (D2) (D3) Relief (D4)
IYDROLC Wetland Hyp Primarv Ind ✓ Surface High Wa Saturation ✓ Saturation ✓ Drift dep Algal Ma ✓ Iron Dep ✓ Surface Field Observ Surface Field Observ Saturation Pro-	DGY drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) vations: rr Present? Present?	ors: e is sufficier Yes Yes Yes	1 2 7 7 7 7 7 7 7 7 7 7	parsely Veg Marl Deposit: Hydrogen Su Dry-Season M Dther (Explain Depth (inch	etated Co s (B15) Ifide Odo Vater Tab n in Rem	ncave Surf r (C1) ble (C2) arks)	ace (B8)		Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresse Geomorphic Positi Shallow Aquitard Aicrotopographic SAC-neutral Test	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ded Plants (D1) ion (D2) (D3) Relief (D4) (D5)
IYDROLC Wetland Hyp Primarv Ind ✓ Surface High Wa Saturatio ✓ Saturatio ✓ Sedimer ✓ Drift dep ✓ Algal Ma ✓ Iron Dep ✓ Surface Field Obsern Surface Water Water Table I Saturation Pro- (includes cap	DGY drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) vations: rr Present? Present?	ors: e is sufficier Yes O r Yes O r Yes O r	10 () 10 () 10 () 10 ()	iparsely Veg Marl Deposits Hydrogen Su Dry-Season M Dther (Explain Depth (inch Depth (inch Depth (inch	etated Cc s (B15) Ifide Odou Vater Tab n in Rem nes): nes): nes):	ncave Surf r (C1) ble (C2) arks) 12] Wet	Iand Hydrolo	Vater Stained Lea Drainage Patterns Dxidized Rhizosph Presence of Reduc Salt Deposits (C5) Stunted or Stresse Geomorphic Positi Shallow Aquitard Aicrotopographic SAC-neutral Test	aves (B9) (B10) heres along Living Roots (C3) ced Iron (C4) ded Plants (D1) ion (D2) (D3) Relief (D4) (D5)

BEO-02

PUBH Wetland Functional Class: Lakes and Ponds Wildlife Habitat: Deep Open Water without Islands



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1).



Project					- Alaska Region pe Borough Sampling Date: 28-Jul-15		
Annlica	nt/Owner: UIC				Sampling Point: BEO-03		
	jator(s): SLI, EKJ	la	ndform (hil	lside terrac	ze, hummocks etc.): Flat		
	elief (concave, convex, none): none			% / 0.0	,		
	ion : Northern Alaska		.26422333		Long.: -156.5067666666667 Datum: WGS84		
-			.20422333	33333			
	p Unit Name:	1	Vaa	• No ()	NWI classification: PEM1B		
	natic/hydrologic conditions on the site typical for this egetation \Box , Soil \Box , or Hydrology \Box	significantly d			(If no, explain in Remarks.) Iormal Circumstances" present? Yes ● No ◯		
	egetation, Soil, or Hydrology	naturally prob					
					eded, explain any answers in Remarks.)		
SUMN	MARY OF FINDINGS - Attach site map sh	owing sampl	ling point	locations	s, transects, important features, etc.		
Hy	drophytic Vegetation Present? Yes \bigcirc No \bigcirc		ls	the Sami	pled Area		
Hy	fric Soil Present? Yes $oldsymbol{O}$ No $oldsymbol{O}$			thin a We			
We	tland Hydrology Present? Yes $ullet$ No $igodot$		**1				
	arks: level terrain, bright photosignature. few small TATION - Use scientific names of plants.						
				Indicator	Dominance Test worksheet:		
<u></u>	ee Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)		
2.					Total Number of Dominant		
3.					Species Across All Strata: <u>2</u> (B)		
4.					Percent of dominant Species		
5.					That Are OBL, FACW, or FAC: 100.0% (A/B)		
	Total Cove	er:			Prevalence Index worksheet:		
Sap	ing/Shrub Stratum 50% of Total Cover:	0 20% of	Total Cover	:	Total % Cover of: Multiply by:		
1.	Salix rotundifolia	7	\checkmark	FAC	OBL Species $30 \times 1 = 30$		
2.		0			FACW Species 6.2 $x^2 = 12.4$		
3.		0			FAC Species $15.3 \times 3 = 45.90$ FACU Species $0 \times 4 = 0$		
4.		0			FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0		
5.		0			· <u> </u>		
6.		0			Column Totals: <u>51.5</u> (A) <u>88.30</u> (B)		
7.		0			Prevalence Index = $B/A = 1.715$		
					Hydrophytic Vegetation Indicators:		
					✓ Dominance Test is > 50%		
10.	Total Cov				✓ Prevalence Index is \leq 3.0		
H	50% of Total Cover:		Total Cover	:1.4	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)		
1.	Carex aquatilis	30	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)		
2.	Saxifraga nelsoniana	5		FAC	¹ Indicators of hydric soil and wetland hydrology must		
3.	Eriophorum russeolum	3		FACW	be present, unless disturbed or problematic.		
4.	Des section	3		FAC			
	Poa arctica						
5.	Petasites frigidus	3		FACW	Plot size (radius, or length x width) <u>r=15m</u>		
6.	Petasites frigidus Saxifraga cernua	3		FACW FACW	% Cover of Wetland Bryophytes		
6. 7.	Petasites frigidus Saxifraga cernua Saxifraga foliolosa	3 0.1 0.1		FACW FACW FACW	% Cover of Wetland Bryophytes		
6. 7. 8.	Petasites frigidus Saxifraga cernua Saxifraga foliolosa Stellaria longipes	3 0.1 0.1 0.1		FACW FACW FACW FAC	% Cover of Wetland Bryophytes (Where applicable) % Bare Ground		
6. 7. 8. 9.	Petasites frigidus Saxifraga cernua Saxifraga foliolosa Stellaria longipes Luzula confusa	3 0.1 0.1 0.1 0.1 0.1		FACW FACW FACW FAC FAC	% Cover of Wetland Bryophytes (Where applicable) % Bare Ground 9 Total Cover of Bryophytes 90		
6. 7. 8.	Petasites frigidus Saxifraga cernua Saxifraga foliolosa Stellaria longipes	3 0.1 0.1 0.1 0.1 0.1 0.1		FACW FACW FACW FAC	% Cover of Wetland Bryophytes (Where applicable) % Bare Ground		

Remarks: 1% unid poa, trace unid grass (calamagrostis lapponica?). Low confidence in Saxnel ID--saxifrage, leaves and distribution match Hulten. abundant lichens (dactylina, leopard spot)

-	•	e depth needeo I trix	to documer	nt the indicator or cor Rec	nfirm the ab		cators)		
Depth (inches)	Color (moist		6 C	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-1		10						Fibric Organics	
1-6		10	00					Hemic Organics	
6-7								Sapric Organics	
¹ Type: C=Cor	centration. D=D	epletion. RM	=Reduced	Matrix ² Location	: PL=Por	e Lining. R	C=Root Cha	annel. M=Matrix	
Hydric Soil	Indicators:			Indicators for F	Problema	tic Hydric	Soils ³ :		
Histosol d	or Histel (A1)			🗌 Alaska Color C	hange (T	44) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
✓ Histic Epi	pedon (A2)			Alaska Alpine	swales (T	45)		Underlying Layer	
Hydroger	Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rema	arks)
Thick Dar	k Surface (A12)								
🗌 Alaska Gl	eyed (A13)							imary indicator of wetland I	nydrology,
🗌 Alaska Re	dox (A14)			and an appropria	ite landsca	ape position	must be p	resent.	
Alaska Gl	eyed Pores (A15)		⁴ Give details of	color chan	ge in Rema	rks.		
								T	
Restrictive Lay	er (if present):								
Type: fro	ost							Hydric Soil Present	? Yes $ullet$ No $igodom$
Depth (inc	hes): 7								
Remarks:									
	IGY Irology Indicat							Casandan / Ind	liastans (2 an many naminal)
	57		(nt)						licators (2 or more required) ed Leaves (B9)
	icators (any on	e is sufficie			/isible as	A	(D7)		
	Water (A1) ter Table (A2)					-		_	atterns (B10) izospheres along Living Roots (C3)
Saturatio				Sparsely Ve	-	Sincave Suri			Reduced Iron (C4)
Water Ma				Hydrogen S	. ,	r (C1)		Salt Deposit	· · /
	t Deposits (B2)			Dry-Season					Stressed Plants (D1)
Drift dep				Other (Expla				_	: Position (D2)
	t or Crust (B4)					arksj		Shallow Aqu	
Iron Dep									aphic Relief (D4)
	Soil Cracks (B6)							FAC-neutral	
Field Observ	. ,								
Surface Water		$_{Yes}$ \bigcirc	No 🖲	Depth (inc	hes):		7		
Water Table P		Yes \bigcirc	No 🖲	Depth (inc			Wotl	land Hydrology Prese	nt? Yes 🖲 No 🔾
Saturation Pre								and fryarology frese	
(includes capi		Yes 🖲	No O	Depth (inc	thes):	6			
Recorded Da	ta (stream gau	ige, monito	or well, ae	rial photo, previ	ous inspe	ection), if	available:		
Remarks:									

PEM1B Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Saturation (A3), Shallow Aquitard (D3), FAC-neutral Test (D5).



Project/Site: Barrow Environmental Obseratory		Borough/City:	North Slo	pe Borough Sampling Date: 28-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-04
Investigator(s): SLI, EKJ		Landform (hill	side, terrac	e, hummocks etc.): Flat
Local relief (concave, convex, none): concave		Slope: 0.0		2
Subregion : Northern Alaska	lat:	 71.263845		 Long.: -156.50173 Datum: WGS84
Soil Map Unit Name:	Lut.	71.203043		NWI classification: PEM1E
		Vee	• No ()	
Are climatic/hydrologic conditions on the site typical for this tin Are Vegetation , soil , or Hydrology s	-			
		tly disturbed?		
		problematic?		eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map show Hvdrophytic Vegetation Present? Yes No	ving sai	mpling point	locations	s, transects, important features, etc.
		ls t	the Sam _l	pled Area
Hydric Soil Present? Yes No		wit	thin a We	etland? Yes \odot No \bigcirc
Wetland Hydrology Present? Yes No Remarks: low center, low relief polygonal tundra. scattered				
VEGETATION - Use scientific names of plants. Lis	1e or pe	m1/ss1e.		
	Absolute		•	Dominance Test worksheet:
Tree Stratum	% Cove		Status	Number of Dominant Species
1				That are OBL, FACW, or FAC: (A)
2				Total Number of Dominant Species Across All Strata: 1 (B)
3				Percent of dominant Species
4				That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
5				Prevalence Index worksheet:
Total Cover:		_		Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover:	0 209	% of Total Cover:	0	OBL Species <u>37.1</u> x 1 = <u>37.1</u>
1				FACW Species $3 \times 2 = 6$
2				FAC Species $0 \times 3 = 0$
3				FACU Species $0 x 4 = 0$
4		. Ц		UPL Species $0 \times 5 = 0$
5		. Ц		
6	-			Column Totals: <u>40.1</u> (A) <u>43.1</u> (B)
7				Prevalence Index = B/A = <u>1.075</u>
8.	-			Hydrophytic Vegetation Indicators:
9				✓ Dominance Test is > 50%
10				✓ Prevalence Index is ≤3.0
Herb Stratum50% of Total Cover:		_	: 0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Carex aquatilis	30	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Eriophorum angustifolium	7		OBL	¹ Indicators of hydric soil and wetland hydrology must
3. Eriophorum russeolum	3		FACW	be present, unless disturbed or problematic.
4. Arctophila fulva	0.1		OBL	
5.	0			Plot size (radius, or length x width) r=10m
6				% Cover of Wetland Bryophytes
7	0			(Where applicable)
8	0			% Bare Ground <u>45</u>
9	0	. Ц		Total Cover of Bryophytes 50
10	0	. 🗆		Hydrophytic
Total Cover:				Vegetation Present? Yes • No ·
50% of Total Cover:	<u>).05</u> 209	% of Total Cover:	8.02	

Remarks: trace ranunculus pallasii (spoon like, fleshy leaves). Trace unidentified grass.

	-	e depth nee atrix	eded to docun	nent the indicator or con Rec	nfirm the ab Iox Featu		ators)		
Depth (inches)	Color (mois	it)	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-1								Fibric Organics	
1-7			100					Hemic Organics	
7-8		3/3	100	,				Silt Loam	
8-13			100					Hemic Organics	with mineral inclusions
0 15									
		Depletion.	RM=Reduce	ed Matrix ² Location				annel. M=Matrix	
Hydric Soil	Indicators:			Indicators for I			Soils' :	_	
_	or Histel (A1)			Alaska Color C		-		Alaska Gleyed Without	Hue 5Y or Redder
	ipedon (A2)			Alaska Alpine	•			Underlying Layer	
	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rem	arks)
_	rk Surface (A12)			3 One indicator o	fhydroph	vtic vegetati	ion one pri	imany indicator of wetland	hydrology
	leyed (A13)			and an appropria				imary indicator of wetland resent.	пуш оюуу,
_	edox (A14)	-\							
🔄 Alaska G	leyed Pores (A15	5)		⁴ Give details of	color chan	nge in Rema	rks.		
Restrictive La	ver (if present):								
Type: fr	ost							Hydric Soil Presen	t? Yes 🖲 No 🔾
Depth (in									
Remarks:									
HYDROLO									
	drology Indica								dicators (2 or more required)
	icators (any o	ne is suff	icient)						ned Leaves (B9)
	Water (A1)			Inundation '		-			atterns (B10)
	ter Table (A2)			Sparsely Ve	-	oncave Surfa	ace (B8)		nizospheres along Living Roots (C3)
Saturatio	. ,			Marl Deposi					f Reduced Iron (C4)
	arks (B1)			Hydrogen S				Salt Deposi	
	t Deposits (B2)			Dry-Season		. ,			Stressed Plants (D1)
	oosits (B3)			Other (Expla	ain in Rem	narks)		Geomorphi	
	t or Crust (B4)							Shallow Aq	. ,
✓ Iron Dep	. ,								raphic Relief (D4)
	Soil Cracks (B6)							FAC-neutra	i Test (DS)
Field Observ		$_{\sf Yes}$ \bigcirc	No 🖲				7		
Surface Wate				Depth (inc	·				
Water Table		Yes 🖲		Depth (inc	hes):	1	Wet	and Hydrology Prese	ent? Yes 🖲 No 🔾
Saturation Pr (includes cap		Yes 🖲	No 〇	Depth (inc	hes):	0			
Recorded Da	ata (stream ga	uge, mor	nitor well, a	aerial photo, previ	ous insp	ection), if a	available:		
Demension									
Remarks: D3seasona	l frost								
	temp 39.5, ec	370							
· · · · · · · · · · · · · · · · · · ·	,,								

PEM1E Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5).



Project	/Site: Barrow Environmental Obseratory	В	orough/City:	North Slo	pe Borough Sampling Date: 28-Jul-15
Applica	nt/Owner: UIC				Sampling Point: BEO-05
Investig	gator(s): SLI. EKJ		Landform (hills	side, terrac	e, hummocks etc.): Flat
Local r	elief (concave, convex, none): convex		Slope: 0.0		P
Subrea	ion : Northern Alaska	Lat.:	71.263858333		Long.: -156.5017616666667 Datum: WGS84
-	p Unit Name:				NWI classification: PEM1B
	natic/hydrologic conditions on the site typical for this ti	mo of voor		• No ()	(If no, explain in Remarks.)
			/ disturbed?		ormal Circumstances" present? Yes No
		• •	oblematic?		eded, explain any answers in Remarks.)
SUMN	IARY OF FINDINGS - Attach site map show	wing sam	pling point	locations	s, transects, important features, etc.
Hyd	drophytic Vegetation Present? Yes No		ls t	he Samr	oled Area
Hyd	dric Soil Present? Yes $oldsymbol{igstarrow}$ No $igstarrow$			hin a We	
We	tland Hydrology Present? Yes $oldsymbol{igstarrow}$ No $igstarrow$		WIL		
Rem		gonal tund	ra. while the r	ims are sat	curated, the community as a whole is best characterized as
	pem1e. abundant goose scat, vole tunnels.				
VEGE	TATION - Use scientific names of plants. Li	st all spe	cies in the i	olot.	
		Absolute	Dominant		Dominance Test worksheet:
Tr	ee Stratum	% Cover	Species?	Status	Number of Dominant Species
1.					That are OBL, FACW, or FAC: (A)
2.					Total Number of Dominant
3.					Species Across All Strata: <u>2</u> (B)
4.					Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
5.					
	Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by:
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20%	of Total Cover:	0	
1.	Salix pulchra	5	\checkmark	FACW	
2.	Salix rotundifolia	1		FAC	
3.		0			FAC Species <u>5</u> x 3 = <u>15</u> FACU Species <u>0.1</u> x 4 = <u>0.400</u>
4.		0			UPL Species 0.1 x = 0.400
5.		0			
6.		0			Column Totals: <u>45.2</u> (A) <u>67.60</u> (B)
7.		0			Prevalence Index = B/A = <u>1.496</u>
8.					
9.					✓ Dominance Test is > 50%
10.					✓ Prevalence Index is ≤ 3.0
	Total Cover	_			Morphological Adaptations ¹ (Provide supporting data in
He	erb Stratum 50% of Total Cover:	3 20%	of Total Cover:	1.2	Remarks or on a separate sheet)
1.	Carex aquatilis	25	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2.	Eriophorum russeolum	7		FACW	¹ Indicators of hydric soil and wetland hydrology must
3.	Juncus arcticus	3		OBL	be present, unless disturbed or problematic.
4.	Festuca rubra	3		FAC	
5.	Poa arctica	1		FAC	Plot size (radius, or length x width) <u>1m x 5m</u>
6.	Saxifraga cernua	0.1		FACW	% Cover of Wetland Bryophytes
7.	Saxifraga tricuspidata	0.1		FACU	(Where applicable)
8.					% Bare Ground
9.					Total Cover of Bryophytes
10.					Hydrophytic
	Total Cover		of Total C		Vegetation Present? Yes No
	50% of Total Cover:	<u>19.6</u> 20%	of Total Cover:	7.84	
Rem	arks:				·

3-7 100% Hemic 3-7 100% Hemic 3-7 100% Hemic 9 Image: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M ype: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Histic Epipedon (A2) Alaska Alpine swales (TA5) Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Thick Dark Surface (A12) ³ One indicator of hydrophytic vegetation, one primary ir and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. strictive Layer (if present): Image: Color change in Remarks.	Texture Remarks Organics
0-3 100 Hemic 3-7 100%6 Histo 100 Alasta 100 Alasta Close of Histel (A1) Alaska Close of Histel (A1) Alaska Close Corchange (TA4) ⁴ Histic Epipedon (A2) Alaska Redox With 2.5Y Hue Ott Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Ott Thick Dark Surface (A12) Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. Hydrogen Sulfide (A4) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A15) 4 Give details of color change in Remarks. strictive Layer (if present): Trpre: seasonal frost Hydrogen Sulfide (A4)<	Organics with 10YR3/3 silt loam inclusions
ype: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Histic Epipedon (A2) Alaska Alpine swales (TA5) Hydrogen Sulfide (A4) Alaska Redox With 2.SY Hue Ott Alaska Gleyed (A13) Alaska Gleyed (A13) ³ One indicator of hydrophytic vegetation, one primary in and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. strictive Layer (if present): Type: seasonal frost Depth (inches): 7 marks: tic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DEDEDLOGY ettand Hydrology Indicators: imary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Mari Deposits (B15) Water Marks (B1) Hydrogen Suffade Odor (C1) Sediment Deposits (B3) Other (Explain in Remarks)	
ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Ala Histic Epipedon (A2) Alaska Alpine swales (TA5) United to the system of the syste	
dric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Ala Histic Epipedon (A2) Alaska Alpine swales (TA5) Unitedity Hydrogen Sulfide (A4) Alaska Alpine swales (TA5) Unitedity Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Ottedity Thick Dark Surface (A12) Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. Hyd Trictive Layer (if present): Type: seasonal frost Hyd Depth (inches): 7 Hyd Histic to adjacent BEO-04 but with silt loam inclusions Hyd DROLOGY Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Sediment Deposits (B3) Dry-Season Water Table (C2)	
dric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Ala Histic Epipedon (A2) Alaska Alpine swales (TA5) United to the swales (TA5) Hydrogen Sulfide (A4) Alaska Alpine swales (TA5) United to the swales (TA4) Hydrogen Sulfide (A4) Alaska Alpine swales (TA5) Otted to the swales (TA5) Histic Epipedon (A2) Alaska Alpine swales (TA5) United to the swales (TA5) Histic Epipedon (A2) Alaska Alpine swales (TA5) Otted to the swales (TA5) Histos Constrained to the swales (TA5) Alaska Redox (With 2.5Y Hue Otted to the swales (TA5) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) * Give details of color change in Remarks. rictive Layer (if present): Trype: seasonal frost Hyd Hyd Depth (inches): 7 Interface (Tab (Tab (Tab (Tab (Tab (Tab (Tab (Tab	
Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Ala Histic Epipedon (A2) Alaska Alpine swales (TA5) Und Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Ott Thick Dark Surface (A12) alaska Redox (A14) alaska Redox (A14) Alaska Gleyed (A13) a One indicator of hydrophytic vegetation, one primary in and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. trictive Layer (if present): Type: seasonal frost Hyd Depth (inches): 7 haska: herdit for the symbol of	=Matrix
Histic Epipedon (A2) Alaska Alpine swales (TA5) United to the swales of the swales (TA5) Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Ott Thick Dark Surface (A12) 3 One indicator of hydrophytic vegetation, one primary in and an appropriate landscape position must be present. Alaska Gleyed (A13) 3 One indicator of hydrophytic vegetation, one primary in and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. trictive Layer (if present): Type: seasonal frost Depth (inches): 7 Hyd narks: ic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DROLOGY Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. strictive Layer (if present): Type: seasonal frost Depth (inches): 7 marks: tic epipedon, similar to adjacent BEO-04 but with silt loam inclusions PROLOGY ettand Hydrology Indicators: imary Indicators (any one is sufficient) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Water Marks (B1) Dry-Season Water Table (A2) Dry-Season Water Table (C2) Drift deposits (B3)	ska Gleyed Without Hue 5Y or Redder derlying Layer
Alaska Gleyed (A13) 3 One indicator of hydrophytic vegetation, one primary in and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. trictive Layer (if present): + Give details of color change in Remarks. trictive Layer (if present): + Give details of color change in Remarks. Depth (inches): 7 - Hyd narks:	er (Explain in Remarks)
Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Redox (A14) 4 Give details of color change in Remarks. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. trictive Layer (if present): Hyd Type: seasonal frost Hyd Depth (inches): 7 Particle narks: ic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DROLOGY Inundation Visible on Aerial Imagery (B7) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	dicator of wetland hydrology
Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. trictive Layer (if present): Hyd Type: seasonal frost Hyd Depth (inches): 7 Hyd narks: ic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DROLOGY Inundation Visible on Aerial Imagery (B7) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	alcator of welland mydrology,
Type: seasonal frost Hyd Depth (inches): 7 Image: Seasonal frost marks: ic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DROLOGY Image: Seasonal frost ttand Hydrology Indicators: Image: Seasonal frost mary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
Depth (inches): 7 narks: ic epipedon, similar to adjacent BEO-04 but with silt loam inclusions DROLOGY tland Hydrology Indicators: mary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
DROLOGY tland Hydrology Indicators: mary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	ric Soil Present? Yes 🖲 No 🔾
TOROLOGY etland Hydrology Indicators: imary Indicators (anv one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
etland Hydrology Indicators: imary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
imary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	
Surface Water (A1) Inundation Visible on Aerial Imagery (B7) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	Secondary Indicators (2 or more required)
High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	Water Stained Leaves (B9)
Saturation (A3) Marl Deposits (B15) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	Drainage Patterns (B10)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	 Oxidized Rhizospheres along Living Roots (C Presence of Reduced Iron (C4)
Sediment Deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks)	□ Salt Deposits (C5)
Drift deposits (B3)	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
Iron Deposits (B5)	Microtopographic Relief (D4)
Surface Soil Cracks (B6)	FAC-neutral Test (D5)
eld Observations:	
rface Water Present? Yes No O Depth (inches):	
	lydrology Present? Yes 🖲 No 🔾
turation Present? Yes Ves No Depth (inches): 2	
corded Data (stream gauge, monitor well, aerial photo, previous inspection), if available:	

PEM1B

Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Saturation (A3), Shallow Aquitard (D3), FAC-neutral Test (D5).



Project/Site: Barrow Environmental Obseratory	В	orough/City:	North Slo	pe Borough Sampling Date: 28-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-06
nvestigator(s): SLI, EKJ		Landform (hill	side, terrac	ce, hummocks etc.): Swale
ocal relief (concave, convex, none): concave		Slope: 0.0	%/ 0.0	D° Elevation: 10
ubregion : Northern Alaska	Lat.:	71.265085		Long.: -156.494473333333 Datum: WGS84
oil Map Unit Name:	-			NWI classification: PEM1H
re climatic/hydrologic conditions on the site typical for thi	s time of year	2 Yes	• No O	
Are Vegetation , Soil , or Hydrology				Iormal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology				eded, explain any answers in Remarks.)
			,	
SUMMARY OF FINDINGS - Attach site map sh	<u> </u>	pling point	locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🔍 No 🔾		ls f	the Samr	pled Area
Hydric Soil Present? Yes $oldsymbol{igstar}$ No $igstar$)		thin a We	
Wetland Hydrology Present? Yes $oldsymbol{igstar}$ No $igstar$				
abundant goose scat and feathers on scatter	ed high points	s.		ike in a more typical year. numerous dunlin in community,
EGETATION - Use scientific names of plants.	. List all spe	cies in the	plot.	
Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
Tree Stratum			Status	Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
2.				Total Number of Dominant
3				Species Across All Strata: (B)
4.				Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
5.				That Are OBL, FACW, or FAC: 100.0% (A/B)
Total Cov	ver:			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:	20%	of Total Cover:	0	Total % Cover of: Multiply by:
1				OBL Species $30 \times 1 = 30$
2.				FACW Species $0 \times 2 = 0$
3.				FAC Species 0 x 3 = 0
4.				FACU Species 0 $x 4 = 0$ UPL Species 0 $x 5 = 0$
5.				
6				Column Totals: <u>30</u> (A) <u>30</u> (B)
7				Prevalence Index = B/A = _1.000_
8				Hydrophytic Vegetation Indicators:
9				✓ Dominance Test is > 50%
10				✓ Prevalence Index is ≤3.0
Total Cov 50% of Total Cover:		of Total Cover:	. 0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
	30	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
Carex aquatinis 2				¹ Indicators of hydric soil and wetland hydrology must
3.				be present, unless disturbed or problematic.
4.				
5.				Plot size (radius, or length x width) $r=15m$
6.				% Cover of Wetland Bryophytes
7				(Where applicable)
				% Bare Ground <u>100</u>
8				Total Cover of Bryophytes
8 9				
9 10	0			Hydrophytic
9	0 0 ver: 30		6	

Depth	Matrix		Redo	х геац	ires		_				
	or (moist)	%	Color (moist)	%	$Type^1$	Loc 2	1	Fexture	-	Rema	arks
0-3							Peat				
3-16							Mucky Pe	at	¯		
									_		
				-			- ,		_		
where C-Concentration	on D-Depletion		ed Matrix ² Location:	DI – Dor		-Poot Chr	nnol M-N	Astrix			
ydric Soil Indicat		. KM-Reduce	Indicators for Pr								
- -			Alaska Color Ch			Solis" :					
Histosol or Histel	. ,				-			a Gleyed Withou Iying Layer	it Hue 5Y o	or Redder	
Histic Epipedon (-		Alaska Alpine S	•			_		aarke)		
Hydrogen Sulfide	. ,			viui 2.5Y	ilue			(Explain in Rem	iai KS)		
Thick Dark Surfa	. ,		³ One indicator of	hydronh	vtic vegetati	on, one pr	imarv india	cator of wetland	hydrology	v.	
Alaska Gleyed (A	-		and an appropriat						, a. olog)	,,	
Alaska Redox (A1			⁴ Give details of co	lor cha-	ao in Dom-	ke					
	163 (MIJ)			JUT CHAN	iye in kemar	к5.					
strictive Layer (if pr	esent):										
Type: seasonal	-						Hydrie	c Soil Presen	it? Ye	es 🕘 🛛 N	o ()
·// ··· ···							_				-
Depth (inches): 16 marks:	5										
marks:	5										
marks: /DROLOGY								Secondary In	dicators	(2 or more	a required)
marks: /DROLOGY etland Hydrology	Indicators:	fficient)						Secondary In			e required)
marks: /DROLOGY etland Hydrology rimary Indicators	Indicators: (any one is suf	fficient)	- Inundation Vi	icible on	Aerial Image	an/ (B7)		Water Stai	ned Leave	es (B9)	<u>required)</u>
Marks: DROLOGY etland Hydrology rimary Indicators Surface Water (<i>J</i>	Indicators: (any one is sul (1)	fficient)	Inundation Vi		-			Water Stai	ned Leave Patterns (B	es (B9) 310)	
Marks: /DROLOGY etland Hydrology rimary Indicators Surface Water (A High Water Table	Indicators: (any one is sul (1)	fficient)	Sparsely Vege	etated Co	-			Water Stai	ned Leave Patterns (B hizosphere	es (B9) 310) es along Liv	
/DROLOGY etland Hydrology rimary Indicators Surface Water (A High Water Tabl Saturation (A3)	Indicators: (any one is suf (1) e (A2)	fficient)	Sparsely Vege	etated Co ; (B15)	oncave Surfa			Water Stai	ned Leave Patterns (B hizosphere of Reduced	es (B9) 310) es along Liv	
Marks: (DROLOGY etland Hydrology rimary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1	Indicators: (any one is sur \1) e (A2))	fficient)	Sparsely Vege	etated Co s (B15) fide Odo	oncave Surfa or (C1)			 Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos 	ned Leave Patterns (B hizosphere of Reduced sits (C5)	es (B9) 310) es along Liv I Iron (C4)	
Marks: /DROLOGY etland Hydrology rimary Indicators Surface Water (<i>I</i> High Water Tabl Saturation (A3) Water Marks (B1 Sediment Depos	Indicators: (any one is sub (1) e (A2)) its (B2)	fficient)	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)			Water Stai	ned Leave Patterns (B hizosphere of Reduced sits (C5)	es (B9) 810) es along Liv I Iron (C4) Plants (D1)	
Marks: (DROLOGY etland Hydrology rimary Indicators Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B	Indicators: (any one is sub (A1) e (A2)) its (B2) 3)	fficient)	Sparsely Vege	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)			Water Stail Drainage F Oxidized R ✓ Presence c Salt Depose Stunted or Geomorph	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position	es (B9) 810) es along Liv 1 Iron (C4) Plants (D1) (D2)	
Marks: (DROLOGY etland Hydrology rimary Indicators Surface Water (<i>J</i> High Water Tabl Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Crus	Indicators: (any one is suf \1) e (A2)) its (B2) 3) st (B4)	fficient)	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)			Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Acc	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D3	es (B9) B10) es along Liv I Iron (C4) Plants (D1) (D2) B)	
marks: /DROLOGY etland Hydrology rimarv Indicators Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Cru: Iron Deposits (B	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5)	fficient)	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)			Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopogo	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D3 graphic Re	es (B9) B10) es along Liv I Iron (C4) Plants (D1) (D2) B) lief (D4)	
(DROLOGY retiand Hydrology rimary Indicators Surface Water (A) High Water Table Saturation (A3) Water Marks (B1) Sediment Deposits (B) Drift deposits (B) Algal Mat or Crussion Iron Deposits (B) Surface Soil Crace	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5) sks (B6)	fficient)	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)			Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Acc	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D3 graphic Re	es (B9) B10) es along Liv I Iron (C4) Plants (D1) (D2) B) lief (D4)	e required) ing Roots (C3)
 marks: /DROLOGY tetland Hydrology rimary Indicators Surface Water (<i>I</i> High Water Tabl Saturation (A3) Water Marks (B1 Sediment Deposits (B Algal Mat or Cru: Iron Deposits (B Surface Soil Crace teld Observations: 	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5) sks (B6)		Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain	etated Cc ; (B15) fide Odo Vater Tat n in Rem	oncave Surfa or (C1) ble (C2) barks)		·	Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopogo	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D3 graphic Re	es (B9) B10) es along Liv I Iron (C4) Plants (D1) (D2) B) lief (D4)	
Provide Contemporation of the second state of	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5) sks (B6)	No 〇	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain	etated Cc ; (B15) fide Odo Vater Tat n in Rem es):	oncave Surfa or (C1) ble (C2) larks) 4	(B8)		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
VDROLOGY Vetland Hydrology rimary Indicators Surface Water (<i>I</i> High Water Table Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Crue Iron Deposits (B Surface Soil Crace eld Observations: urface Water Present?	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5) (ks (B6) t? Yes (2) Yes (2)	 No () No () 	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch	etated Cc : (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) barks)	(B8)		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopogo	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	
Primarks: YDROLOGY /etland Hydrology Primary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1 Sediment Deposits (B Algal Mat or Cru: Iron Deposits (B Surface Soil Craation iethd Observations: urface Water Present /ater Table Present? aturation Present?	Indicators: (any one is suf (any one is suf (b) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c	 No () No () 	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain	etated Cc : (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) larks) 4	(B8)		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
Primarks: YDROLOGY /etland Hydrology Primary Indicators ✓ Surface Water (/ ✓ High Water Tabl ✓ Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Cru: ✓ Iron Deposits (B Surface Soil Crac ield Observations: urface Water Present? aturation Present? aturation Present? ncludes capillary frir	Indicators: (any one is sufficient of the second	 No ○ No ○ No ○ 	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch	etated Cc ; (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) harks)	 Wet		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
emarks: YDROLOGY Vetland Hydrology Primary Indicators ✓ Surface Water (A ✓ High Water Tabl ✓ Saturation (A3) Water Marks (B1 Sediment Deposits (B Drift deposits (B Drift deposits (B Surface Soil Crac ield Observations: urface Water Present? aturation Present? aturation Present? includes capillary frir ecorded Data (stree	Indicators: (any one is sufficient of the second	 No ○ No ○ No ○ 	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch Depth (inch	etated Cc ; (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) harks)	 Wet		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
Primarks: YDROLOGY Yetland Hydrology Primary Indicators ✓ Surface Water (/ ✓ High Water Tabl ✓ Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Cru: ✓ Iron Deposits (B Surface Soil Crac ield Observations: urface Water Present? aturation Present? includes capillary frir	Indicators: (any one is suf (1) e (A2)) its (B2) 3) st (B4) 5) (ks (B6) (2) (4) (4) (4) (5) (5) (5) (5) (6) (7) (6) (7) (6) (7) (7) (7) (7) (7) (7) (7) (7	 No ○ No ○ No ○ 	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch Depth (inch	etated Cc ; (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) harks)	 Wet		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
emarks: YDROLOGY Vetland Hydrology Primary Indicators ✓ Surface Water (A ✓ High Water Tabl ✓ Saturation (A3) Water Marks (B1 Sediment Deposits (B Drift deposits (B Drift deposits (B Algal Mat or Cru: ✓ Iron Deposits (B Surface Soil Crac ield Observations: urface Water Present? aturation Present? aturation Present? includes capillary frir ecorded Data (stree emarks:	Indicators: (any one is sufficient of the second s	No O No O No O No O	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch Depth (inch	etated Cc ; (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) harks)	 Wet		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)
Primarks: YDROLOGY Vetland Hydrology Primary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1 Sediment Deposits (B Algal Mat or Crue Iron Deposits (B Algal Mat or Crue Iron Deposits (B Surface Soil Crac ield Observations: aurface Water Present? acturation Present? ac	Indicators: (any one is sufficient of the second s	No O No O No O No O	Sparsely Vege Marl Deposits Hydrogen Sul Dry-Season V Other (Explain Depth (inch Depth (inch	etated Cc ; (B15) fide Odo Vater Tat n in Rem es): es):	oncave Surfa or (C1) ble (C2) harks)	 Wet		Water Stai Drainage F Oxidized R ✓ Presence c Salt Depos Stunted or Geomorph ✓ Shallow Ac Microtopog FAC-neutra	ned Leave Patterns (B hizosphere of Reduced sits (C5) • Stressed ic Position quitard (D2 graphic Re al Test (D5	es (B9) B10) es along Liv d Iron (C4) Plants (D1) (D2) B) lief (D4) D)	ing Roots (C3)

PEM1H

Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Surface Water (A1), High Water Table (A2), Saturation (A3), Iron Deposits (B5).



Project/Site: Barrow Environmental Obseratory	Bo	prough/City:	North Slo	pe Borough Sampling Date:28-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-07
nvestigator(s): SLI, EKJ	L	andform (hill	side, terrac	ze, hummocks etc.): Lake
Local relief (concave, convex, none): concave		Slope: 0.0		D-
Subregion : Northern Alaska	lat:7	1.265801666	 36667	Long.: -156.494528333333 Datum: WGS84
Soil Map Unit Name:		1.200001000	0001	NWI classification: L1UBH
-		Vaa	• No ()	
Are climatic/hydrologic conditions on the site typical for this Are Vegetation \Box , Soil \Box , or Hydrology \Box	,			(If no, explain in Remarks.) Jormal Circumstances" present? Yes ● No ◯
	significantly			
Are Vegetation 🗹 , Soil 🗹 , or Hydrology 🗌	naturally pro	blematic?	(If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	owing sam	pling point	locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes $ullet$ No $igodot$		le f	ho Sami	pled Area
Hydric Soil Present? Yes ● No ○				
Wetland Hydrology Present? Yes No		wit	thin a We	eliand? fes \otimes No \bigcirc
	horeline. num	erous dunlin	in surf and	lac fringe wetland (see BEO-06). no aquatic fringe besides
sampled wetland (BEO-06). review imagery for	or presence of	islands.		
/EGETATION - Use scientific names of plants.	List all spec	cies in the	plot.	
Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1			Status	Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
2				Total Number of Dominant
3				Species Across All Strata: 0 (B)
				Percent of dominant Species
5.				That Are OBL, FACW, or FAC: 0.0% (A/B)
Total Cov	er:			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:		of Total Cover:	0	Total % Cover of: Multiply by:
				OBL Species x 1 =
1				FACW Species <u>0</u> x 2 = <u>0</u>
2.				FAC Species $0 \times 3 = 0$
3				FACU Species x 4 =
-				UPL Species <u>0</u> x 5 = <u>0</u>
				Column Totals: 0 (A) 0 (B)
7				Prevalence Index = B/A = 0.000
8				Prevalence Index = B/A =0.000
9				Hydrophytic Vegetation Indicators:
9 10				Dominance Test is > 50%
Total Cov	er: 0			Prevalence Index is ≤3.0
Herb Stratum 50% of Total Cover:		of Total Cover:		Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
 1	0			\checkmark Problematic Hydrophytic Vegetation ¹ (Explain)
2.				¹ Indicators of hydric soil and wetland hydrology must
3.				be present, unless disturbed or problematic.
4.				
5.				Plot size (radius, or length x width)
6.				% Cover of Wetland Bryophytes
0.	-			(Where applicable)
	0			
7				% Bare Ground
	0			% Bare Ground Total Cover of Bryophytes
7. 8. 9. 10.	0 0 0			Total Cover of Bryophytes
7. 8. 9.	0 0 er: 0	Df Total Cover:		Total Cover of Bryophytes

Depth		latrix		nt the indicator or cor Red	ox Featı				
(inches)	Color (moi	st)	% (Color (moist)	%	$Type^1$	Loc ²	Texture	Remarks
					-		-		
									-
	·								
Type: C=Co	ncentration. D=	Depletion. R	M=Reduced	Matrix ² Location	: PL=Por	e Lining. R	C=Root Cha	nnel. M=Matrix	
lydric Soil	Indicators:			Indicators for F	roblema	atic Hydric	Soils ³ :		
Histosol	or Histel (A1)			Alaska Color C	hange (T	A4) ⁴		Alaska Gleyed Withou	t Hue 5Y or Redder
Histic Ep	ipedon (A2)			Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydroge	n Sulfide (A4)			Alaska Redox	With 2.5Y	' Hue		Other (Explain in Rem	arks)
_	rk Surface (A12)		3 One in the term					huduala au
_	leyed (A13)			³ One indicator of and an appropria				mary indicator of wetland resent.	nyarology,
_	edox (A14)	-)							
Alaska G	leyed Pores (A1	5)		⁴ Give details of o	color char	nge in Rema	irks.		
ootsiotise I -	(if process)								
	ver (if present):							Hydric Soil Presen	t? Yes 🖲 No 🔾
Type: Depth (in									
	lies).								
emarks:	ssume hydric	11							
YDROLO	DGY								
Vetland Hy	drology Indica	itors:						Secondary In	dicators (2 or more required)
Primary Ind	icators (any o	ne is suffic	ient)					Water Stai	ned Leaves (B9)
✓ Surface	Water (A1)			✓ Inundation \	/isible on	Aerial Imag	jery (B7)	Drainage P	atterns (B10)
🗌 High Wa	ter Table (A2)			Sparsely Veg	getated Co	oncave Surf	ace (B8)	Oxidized R	hizospheres along Living Roots (C3)
Saturatio	on (A3)			Marl Deposit	s (B15)			Presence o	f Reduced Iron (C4)
Water M	arks (B1)			🗌 Hydrogen Si	ulfide Odo	or (C1)		Salt Depos	its (C5)
Sedimer	t Deposits (B2)			Dry-Season	Water Ta	ble (C2)		Stunted or	Stressed Plants (D1)
Drift dep	oosits (B3)			Other (Expla	in in Rem	narks)		Geomorphi	ic Position (D2)
Algal Ma	t or Crust (B4)							Shallow Aq	uitard (D3)
Iron Dep	oosits (B5)							Microtopog	raphic Relief (D4)
Surface	Soil Cracks (B6)							FAC-neutra	al Test (D5)
ield Observ					_		_		
urface Wate	r Present?	Yes 🖲	No O	Depth (inc	hes):	36			
Vater Table I	Present?	Yes \bigcirc	No 🖲	Depth (inc	hes):		Wet	and Hydrology Pres	ent? Yes 🖲 No 🔾
aturation Pro	llary fringe)	Yes O	No 🖲	Depth (inc	,]		
lecorded Da	ata (stream ga	luge, monit	tor well, ae	rial photo, previ	ous insp	ection), if	available:		
lemarks: vater temp 4	14								
c 250	тт								
	ter depth, est	imate over	36in						

L1UBH Wetland Functional Class: Lakes and Ponds Wildlife Habitat: Deep Open Water without Islands



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface water (A1), Inundation Visible on Aerial Imagery (B7).



WETLAND DETERM	NATION DATA FORM	- Alaska Region	
Project/Site: Barrow Environmental Obseratory	Borough/City: North Slop	e Borough Sa	ampling Date:29-Jul-15
Applicant/Owner: UIC		Sampling	Point: BEO-08
Investigator(s): SLI, EKJ	Landform (hillside, terrac	e, hummocks etc.): F	lat
Local relief (concave, convex, none): none	Slope: 0.0 % / 0.0	Elevation: 10	
Subregion : Northern Alaska Lat.:	71.27658	Long.: -156.51286333	3333 Datum: WGS84
Soil Map Unit Name:		NWI classific	ation: PEM1E
	ntly disturbed? Are "N problematic? (If nee	oled Area	resent? Yes No Osin Remarks.)
Remarks: Wet sedge tundra west of West Twin Lake. light atv dan no defined/heavily rutted trails observed. VEGETATION - Use scientific names of plants. List all sp		acks in BEO. ATV tracks a	appear dispersed throughout area,
Absolut	e Dominant Indicator	Dominance Test works	heet:
Tree Stratum % Cove	er Species? Status	Number of Dominant Spe	
1		That are OBL, FACW, or I	
2		Total Number of Dominan Species Across All Strata:	
3		Dereent of dominant Cross	

2.		_				Species Across All Strata:	4 (E	B)
3.		_				Percent of dominant Species	(-	_,
4.		_					100.0% (4	A/B)
5.								,
	Total Cove	r:	0			Prevalence Index worksheet:		
Sap	ling/Shrub Stratum 50% of Total Cover: _	0	20% of Tota	l Cover:	0	Total % Cover of: Multiply	by:	
· · ·			0.1		FACW	OBL Species44.2 x 1 =	44.2	
	Salix pulchra		0.1		FACW	FACW Species <u>10.3</u> x 2 =	20.60	
						FAC Species x 3 =	0	
			0			FACU Species x 4 =	0	
4.		_	0			UPL Species 0 x 5 =	0	
5.		_	0				64.00	
			0			Column Totals: <u>54.5</u> (A)	64.80	(B)
		_	0			Prevalence Index = B/A =	1.189	
	·	_	0			Hydrophytic Vegetation Indicators:		
9.	<i>v</i>	_				Dominance Test is > 50%		
10.		_	0			✓ Prevalence Index is ≤ 3.0		
	Total Cove	r: _	0.1					
н	erb Stratum 50% of Total Cover: _	0.05	20% of Tota	al Cover:	0.02	Morphological Adaptations ¹ (Provide Remarks or on a separate sheet)	supporting data	ain
			25		OBL	$\square Problematic Hydrophytic Vegetation 1$	(Explain)	
1.	Carex aquatilis				FACW			
2.	Eriophorum russeolum	_	10	\checkmark		¹ Indicators of hydric soil and wetland hydro be present, unless disturbed or problemati		
3.	Eriophorum angustifolium	_			OBL			
4.	Eriophorum scheuchzeri	_	5		OBL			
5.	Arctophila fulva	_	2		OBL	Plot size (radius, or length x width)	<u>r=15m</u>	
6.	Ranunculus pallasii	_	2		OBL	% Cover of Wetland Bryophytes		
7.	Saxifraga foliolosa	_	0.1		FACW	(Where applicable)		
8.	Juncus arcticus	_	0.1		OBL	% Bare Ground	_10	_
9.	Petasites frigidus	_	0.1		FACW	Total Cover of Bryophytes	85	_
10.	Juncus biglumis	_	0.1		OBL	Hydrophytic		
	Total Cove	r: _	54.4			Vegetation		
	50% of Total Cover:	27.2	20% of Tota	l Cover:	10.88	Present? Yes • No O		
Rem	arks: 1% unidentified grass, trace saxcer							

Profile Description: (Describe	Matrix			lox Featı			_	
(inches) Color (i	noist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-7		100					Mucky Peat	hemic organics
7-11		100					Mucky Peat	hemic organics w mineral inclusions
11-12		100	-				Silt Loam	w organic inclusions
							<u></u>	
Type: C=Concentration.	D=Depletion. R	M=Reduce					annel. M=Matrix	
Hydric Soil Indicators:						Soils' :		
Histosol or Histel (A1			Alaska Color C		-			thout Hue 5Y or Redder
Histic Epipedon (A2)			Alaska Alpine				Underlying Layer	Dever Le)
Hydrogen Sulfide (A4			Alaska Redox	with 2.5Y	Hue		Other (Explain in	kemarks)
Thick Dark Surface (A	.12)		3 One indicator o	fhydroph	vtic venetati		imary indicator of wet	land hydrology
Alaska Gleyed (A13)			and an appropria					
Alaska Redox (A14)	A1E)		4					
Alaska Gleyed Pores	A15)		⁴ Give details of	color chan	ige in Rema	rks.		
estrictive Layer (if prese	it):							
Type: frost							Hydric Soil Pre	sent? Yes 🖲 No 🔾
Depth (inches): 12								
Depth (menes). 12								
							1	
emarks:							1	
emarks: YDROLOGY	icators:						Secondar	v Indicators (2 or more required)
emarks: YDROLOGY Vetland Hydrology Inc		-ient)						y Indicators (2 or more required) Stained Leaves (B9)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an		cient)		Visible on	Aerial Imag	erv (B7)	Water	Stained Leaves (B9)
Primary Indicators (an Surface Water (A1)	v one is suffic	cient)	Inundation V		5	, 、 ,	Water	Stained Leaves (B9) ge Patterns (B10)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) V High Water Table (A	v one is suffic	cient)	Sparsely Ve	getated Co	5	, 、 ,	Water	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3)	v one is suffic	cient)	Sparsely Ve	getated Co ts (B15)	oncave Surfa	, 、 ,	Water Water Water Oraina Oxidiz Preser	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1)	y one is suffic 2)	cient)	Sparsely Ve Marl Deposi	getated Co ts (B15) ulfide Odo	oncave Surfa or (C1)	, 、 ,	Water Water Oraina Oxidiz Salt D	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (I	y one is suffic 2)	cient)	Sparsely Ver	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Water Oraina Oxidiz Salt D Salt D Stunte	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1)
emarks: YDROLOGY Vetland Hydrology Inco Primary Indicators (an Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift deposits (B3)	<u>v one is suffic</u> 2) 32)	cient)	Sparsely Ve Marl Deposi	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Draina Oxidiz Preser Salt D Stunte Geomo	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) V High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift deposits (B3) Algal Mat or Crust (E	<u>v one is suffic</u> 2) 32)	cient)	Sparsely Ver	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Draina Oxidize Salt D Stunte Geome Shallo	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) id or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift deposits (B3) Algal Mat or Crust (E Iron Deposits (B5)	<u>v one is suffic</u> 2) 32) 4)	cient)	Sparsely Ver	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Water Oraina Oxidiz Salt D Salt D Stunte Geome Shallo Microt	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) id or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Drift deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (<u>v one is suffic</u> 2) 32) 4)	cient)	Sparsely Ver	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Water Oraina Oxidiz Salt D Salt D Stunte Geome Shallo Microt	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) id or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3)
Primarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (ield Observations:	<u>v one is suffic</u> 2) 32) 4) 36)		Sparsely Ver Marl Deposi Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal ain in Rem	oncave Surfa or (C1) ble (C2)	, 、 ,	Water Water Oraina Oxidiz Salt D Salt D Stunte Geome Shallo Microt	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) id or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Primarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (ield Observations: urface Water Present?	y one is suffic 2) 32) 4) 36) Yes ○	No •	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Expla	getated Ca ts (B15) ulfide Odc Water Tal ain in Rem thes):	oncave Surfa or (C1) ble (C2) harks)	ace (B8)	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (Field Observations: Surface Water Present? Water Table Present?	y one is suffic 2) 32) 4) 36) Yes ○ Yes ●	No ① No 〇	Sparsely Ver Marl Deposi Hydrogen S Dry-Season Other (Expla	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem hes):	pr (C1) ble (C2) harks)	ace (B8)	Water Water Oraina Oxidiz Salt D Salt D Stunte Geome Shallo Microt	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) V High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (Field Observations: Surface Water Present? Nater Table Present? Saturation Present? Saturation Present? Saturation Present? Saturation Present?	y one is suffic 2) 4) 36) Yes O Yes O Yes O	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odc Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Primarv Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift deposits (B3) Algal Mat or Crust (E Iron Deposits (B5)	y one is suffic 2) 4) 36) Yes O Yes O Yes O	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odc Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Image: Second content of the second content on the second	y one is suffic 2) 4) 36) Yes O Yes O Yes O	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odc Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) V High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E Iron Deposits (B5) Surface Soil Cracks (Field Observations: Surface Water Present? Nater Table Present? Saturation Present? Saturation Present? Saturation Present? Saturation Present?	y one is suffic 2) 32) 4) 36) Yes Yes gauge, moni	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odc Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
emarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B Drift deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Surface Soil Cracks (Field Observations: Surface Water Present? Nater Table Present? Saturation Present? includes capillary fringe) Recorded Data (stream emarks:	y one is suffic 2) 32) 4) 36) Yes Yes gauge, moni	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Primarks: YDROLOGY Vetland Hydrology Inc Primary Indicators (an Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B) Drift deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Surface Soil Cracks (ield Observations: urface Water Present? Autration Present? aturation Present? atur	y one is suffic 2) 32) 4) 36) Yes Yes gauge, moni	No ● No ○ No ○	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem hes):	oncave Surfa] Wet	 Water Draina Oxidiz Preser Salt D Stunte Geome ✔ Shallo Microt ✔ FAC-ne 	Stained Leaves (B9) ge Patterns (B10) ed Rhizospheres along Living Roots (C3 ice of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)

PEM1E Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3).



	/Site:	Barrow Environmenta				orough/City:		- Alaska Region pe Borough	Sampling	Date: 2	29-Jul-15
Applica	- nt/Owne	r: UIC	· ·						 ling Point:		EO-09
••	ator(s):	SLI, EKJ				Landform (hill:	side. terrac	e, hummocks etc.):	Flat		
-		icave, convex, none):	none			Slope: 0.0			-		
		orthern Alaska				71.27663		Long.: -156.51462		Datum	: WGS84
-	p Unit Na			_		11.27003			sification:		
		-					• No ()		-		
	egetatior	rologic conditions on	, or Hydrology	_		/ disturbed?		(If no, explain i lormal Circumstances		.) Yes 🖲	No 〇
	0		, or Hydrology	_ Ŭ					•		
	egetatior				• •	oblematic?		ded, explain any ans			
SUMN	IARY (DF FINDINGS - A			ng sam	pling point	locations	s, transects, impo	ortant feat	ures, etc.	
Hyc	drophytic	Vegetation Present?				ls f	he Samr	oled Area			
Hyc	dric Soil I	Present?	Yes 🔍 No 🤇	\supset			hin a We		Yes 🖲 No	\cap	
We	tland Hy	drology Present?	Yes 🔍 No 🤇	C		WIL				0 0	
	coi on im	et sedge tundra interr mplex. extensive muc e agitated dowitcher, agery. N - Use scientific	d/bare ground sugge , unid shorebirds, ar	ests thank	at the un n nest. fe	usually dry se w goose scat.	ason is the note2 loo	only reason there isr	't standing	water at tim	e of site vis
		Ose selentine						Dominance Test we			
 1.	ee Stratı			0	bsolute 6 Cover	Dominant Species?	Status	Number of Dominant That are OBL, FACW	Species	1	(A)
2.								Total Number of Don Species Across All S	ninant	1	(B)
3.								Percent of dominant			(2)
4.								That Are OBL, FACW		100.0	% (A/B)
5.											
J.,								Prevalence Index w	orksheet:		
			Total C					Prevalence Index w Total % Cove		fultiply by:	
	ling/Shru	ıb Stratum	Total C 50% of Total Cover:			of Total Cover:	0		r of: M		26
<u>Sapl</u>		ıb Stratum	50% of Total Cover:	0		of Total Cover:	0	Total % Cove	rof: M <u>26</u> >	<1 =	<u>26</u>
Sapl 1. 2.			50% of Total Cover:	0	20%	of Total Cover:	0	Total % Cove OBL Species	r of: M <u>26</u> > 5.1 >	$\begin{array}{c} 1 = \\ 2 = \\ 1 \end{array}$	
Sapl 1. 2. 3.	•		50% of Total Cover:	0	20%	of Total Cover:	0	Total % Cove OBL Species FACW Species	r of: N <u>26</u> > 5.1 > >	<1 = <2 = <3 =	0.2
Sapl 1. 2. 3. 4.			50% of Total Cover:	0	20%	of Total Cover:	0	Total % Cove OBL Species FACW Species FAC Species	r of: N <u>26</u> > <u>5.1</u> > <u>0</u> > <u>0</u> >	(1 = (2 = (3 = (4 =	0.2 0
Sapl 1. 2. 3. 4. 5.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species	r of: N <u>26</u> > <u>5.1</u> > <u>0</u> > <u>0</u> > <u>0</u> >	(1 = (2 = 1 (3 = (4 = (5 =)	0.2 0 0 0
Sapl 1. 2. 3. 4.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals:	r of: N 26 > 5.1 > 0 > 0 > 31.1 ($(1 = 1)^{-1}$ $(2 = 1)^{-1}$ $(3 = 1)^{-1}$ $(4 = 1)^{-1}$ $(5 = 1)^{-1}$ $(A) 3 = 10^{-1}$	0.2 0 0 6.2 (B)
Sapl 1. 2. 3. 4. 5. 6. 7.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals:	r of: N <u>26</u> > <u>5.1</u> > <u>0</u> > <u>0</u> > <u>0</u> >	$(1 = 1)^{-1}$ $(2 = 1)^{-1}$ $(3 = 1)^{-1}$ $(4 = 1)^{-1}$ $(5 = 1)^{-1}$ $(A) 3^{-1}$	0.2 0 0 6.2 (B)
Sapi 1. 2. 3. 4. 5. 6. 7. 8.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence	r of: N 26 > 5.1 > 0 > 0 > 31.1 (e Index = B// ation Indicat	(1 =	0.2 0 0 6.2 (B)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegetz ☑ Dominance Test	r of: N 26 > 5.1 > 0 > 0 > 31.1 (e Index = B// stion Indicat is > 50%	(1 =	0.2 0 0 6.2 (B)
Sapl 1. 2. 3. 4. 5. 6. 7. 8. 9.			50% of Total Cover:	0	20%	of Total Cover:	0 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegeta ✓ Dominance Test ✓ Prevalence Inde	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0	(1 =) (2 =) (3 =) (4 =) (5 =) (A), 3 A =, 1.16 tors:	0.2 0 0 6.2 (B) 4
Sapl 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.			50% of Total Cover:	0	20%			Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegeta ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (a separate she	(1 =) (2 =) (3 =) (4 =) (5 =) (5 =) (5 =) (4 =) (5 =) (4 =) (5 =) (4 =) (5 =) (4 =) (5	0.2 0 0 6.2 (B) 4
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.			50% of Total Cover:	0	20%			Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd	r of: N 26 5.1 0 0 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (e separate she rophytic Vege	(1 =	0.2 0 0 6.2 (B) 4 orting data in ain)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. He	erb Stratt Carex a	um_ iquatilis	50% of Total Cover:	0	20%	of Total Cover:		Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegeta ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric s	r of: N 26 5.1 0 0 31.1 (ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (a separate she rophytic Vege soil and wetla	(1 =) $(2 =)$ $(3 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $($	0.2 0 0 6.2 (B) 4 orting data in ain)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3.	erb Strate Carex a Eriopho Arctoph	um_ iquatilis rum russeolum ila fulva	50% of Total Cover:	0	20% 	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd	r of: N 26 5.1 0 0 31.1 (ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (a separate she rophytic Vege soil and wetla	(1 =) $(2 =)$ $(3 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $($	0.2 0 0 6.2 (B) 4 orting data in ain)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 4. 5. 6. 7. 8. 9. 10. 1. 4. 5. 6. 7. 8. 9. 1. 1. 4. 5. 6. 7. 8. 1. 5. 6. 7. 8. 9. 1. 1. 1. 1. 5. 6. 7. 8. 9. 1. 1. 5. 6. 7. 8. 9. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover: Total Cover: 50% of Total Cover:	0	20% 	of Total Cover:	 OBL FACW	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegeta ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric s	r of: N 26 5.1 0 0 31.1 (ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (a separate she rophytic Vege soil and wetla	(1 =) $(2 =)$ $(3 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $($	0.2 0 0 6.2 (B) 4 orting data in ain)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 10. 1. 2. 3. 4. 5. 5. 5. 5. 5. 9. 10. 1. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva	50% of Total Cover: Total Cover: 50% of Total Cover:	0	20% 	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegetz ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric s be present, unless dis Plot size (radius, or	r of: N 26 5.1 0 26 3.1 0 31.1 (1 Index = B// 31.1 (1 constants^{1} $1 \text$	(1 =) $(2 =)$ $(2 =)$ $(3 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(5 =)$ $(6 =)$ $(7 =)$ $($	0.2 0 0 6.2 (B) 4 orting data in ain)
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 5. 6. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 10. 10. 10. 10. 10. 10. 10	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover: Total Cover: 50% of Total Cover:	0	20% 	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is < 3.0 daptations ¹ (a separate she rophytic Vege soil and wetla sturbed or pro- length x widt d Bryophytes	(1 =) $(2 =)$ $(2 =)$ $(3 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(4 =)$ $(5 =)$ $(4 =)$ $(5 =)$ $(5 =)$ $(6 =)$ $(7 =)$ $($	0.2 0 0 0 6.2 (B) 4 orting data in ain) must
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 8. 9. 10. 7. 7. 7. 8. 9. 10. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover:	0	20% 	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence Hydrophytic Vegeta ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric size present, unless dis Plot size (radius, or % Cover of Wetlan, (Where applicable)	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is < 3.0 daptations ¹ (a separate she rophytic Vege soil and wetla sturbed or pro- length x widt d Bryophytes	$(1 = \ (2 = \ 1))$ $(2 = \ 1)$ $(3 = \ (4 = \ (5 = \)))$ $(4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \)$	0.2 0 0 0 6.2 (B) 4 orting data in ain) must =15m
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	erb Stratt Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover: Total Cover: 50% of Total Cover:	0	20%	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence ✔ Dominance Test ✔ Prevalence Inde	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (is separate she rophytic Vege soil and wetla sturbed or pro- length x widid d Bryophytes	$(1 = \ (2 = \ 1))$ $(2 = \ 1)$ $(3 = \ (4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (116)$ $(5 = \))$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(5 = \ $	0.2 0 0 0 6.2 (B) 4 orting data in ain) must =15m 5
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 9. 10. 9. 9. 10. 9. 9. 10. 10. 10. 10. 10. 10. 10. 10	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover: Total Cover: 50% of Total Cover: 50% of Total Cover:	0	20%	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FAC Species UPL Species Column Totals: Prevalence ✓ Dominance Test ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric be present, unless dis Plot size (radius, or % Cover of Wetland (Where applicable) % Bare Ground Total Cover of Bryo	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (is separate she rophytic Vege soil and wetla sturbed or pro- length x widid d Bryophytes	$(1 = \ (2 = \ 1))$ $(2 = \ 1)$ $(3 = \ (4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (116)$ $(5 = \))$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(5 = \ $	0.2 0 0 0 6.2 (B) 4 orting data in ain) must =15m
Sapi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 9. 10. 9. 10. 9. 10. 9. 10. 9. 10. 9. 9. 10. 10. 10. 10. 10. 10. 10. 10	erb Strat Carex a Eriopho Arctoph Saxifraç	um_ iquatilis rum russeolum ila fulva ja cernua	50% of Total Cover: Total Cover: 50% of Total Cover: 50% of Total Cover:	0	20%	of Total Cover:	 	Total % Cove OBL Species FACW Species FAC Species FACU Species UPL Species Column Totals: Prevalence ✓ Prevalence Inde Morphological A Remarks or on a Problematic Hyd ¹ Indicators of hydric e be present, unless dis Plot size (radius, or % Cover of Wetlam (Where applicable) % Bare Ground	r of: N 26 $>$ 5.1 $>$ 0 $>$ 0 $>$ 0 $>$ 31.1 (e Index = B// ation Indicat is > 50% x is ≤ 3.0 daptations ¹ (is separate she rophytic Vege soil and wetla sturbed or pro- length x widid d Bryophytes phytes	$(1 = \ (2 = \ 1))$ $(2 = \ 1)$ $(3 = \ (4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (5 = \))$ $(4 = \ (116)$ $(5 = \))$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(4 = \)$ $(5 = \)$ $(4 = \)$ $(5 = \ $	0.2 0 0 0 6.2 (B) 4 orting data in ain) must =15m 5

Profile Description: (Describe to t Depth	latrix			ox Featu		atorsj	_	
(inches) Color (moi	st) %	. Co	lor (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-7	10	000					Fibric Organics	
7-10	10	0					Hemic Organics	
¹ Type: C=Concentration. D=	Depletion. RM		latrix ² Location: Indicators for P				annel. M=Matrix	
Hydric Soil Indicators:		ו	Alaska Color Cl			50IIS" :		
Histosol or Histel (A1) Histic Epipedon (A2)			Alaska Color Ci Alaska Alpine s		-		Alaska Gleyed Without Underlying Layer	Hue 5Y or Redder
Hydrogen Sulfide (A4)			Alaska Redox V	•	,		Other (Explain in Rem	arks)
Thick Dark Surface (A12)							
Alaska Gleyed (A13)			One indicator of and an appropriat				imary indicator of wetland present.	hydrology,
Alaska Redox (A14)								
Alaska Gleyed Pores (A1	5)	2	⁴ Give details of c	olor chan	ge in Remar	rks.		
Restrictive Layer (if present):								
Type: seasonal frost							Hydric Soil Present	t? Yes 🖲 No 🔾
Depth (inches): 10								
IYDROLOGY								
Wetland Hydrology Indica								dicators (2 or more required)
Primary Indicators (any o	ne is sufficie	nt)	—			()		ned Leaves (B9)
Surface Water (A1) High Water Table (A2)			Inundation V		-	, , ,		atterns (B10) nizospheres along Living Roots (C3)
Saturation (A3)			Sparsely Veg Marl Deposits		oncave Surra	ace (B8)		f Reduced Iron (C4)
Water Marks (B1)			Hydrogen Su	` '	r (C1)		Salt Deposi	
Sediment Deposits (B2)			Dry-Season \					Stressed Plants (D1)
Drift deposits (B3)			Other (Explai	in in Rem	arks)		Geomorphi	c Position (D2)
Algal Mat or Crust (B4)							🖌 Shallow Aq	uitard (D3)
✓ Iron Deposits (B5)								raphic Relief (D4)
Surface Soil Cracks (B6)							✓ FAC-neutra	l Test (D5)
Field Observations:	X ()	No 🖲				,		
Surface Water Present?			Depth (inch					
Water Table Present?		No O	Depth (incl	nes):	0	Wet	land Hydrology Prese	ent? Yes 🖲 No 🔾
Saturation Present? (includes capillary fringe)	Yes 🖲	No 🔿	Depth (incl	nes):	0			
Recorded Data (stream ga	auge, monito	r well, aeri	al photo, previo	ous inspe	ection), if a	available:		
Remarks: D3seasonal frost B5iron floc on sediments temp 38 ec 520								

PEM1F

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5). Shallow Aquitard (D3).



Project/Site: Barrow Environmental Obseratory				- Alaska Region pe Borough Sampling Date: 29-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-10
nvestigator(s): SLI, EKJ	L	andform (hill:	side, terrac	ce, hummocks etc.): Pond
Local relief (concave, convex, none): concave		Slope: 0.0	%/ 0.0	
Subregion : Northern Alaska		1.276726666	 6667	Long.: -156.5148166666667 Datum: WGS84
Soil Map Unit Name:			0001	NWI classification: PUBH
Are climatic/hydrologic conditions on the site typical for this ti	ime of vear?	Yes	• No ()	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly on aturally pro	disturbed?	Are "N	lormal Circumstances" present? Yes $ullet$ No $igodot$
				eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing samp	oling point	locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		ls t	he Samı	pled Area
Hydric Soil Present? Yes No			hin a We	
Wetland Hydrology Present? Yes No Remarks: small shallow tundra pond in complex with PEM				
/EGETATION - Use scientific names of plants. L	ist all spec	ies in the	olot.	
	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
1. 2.				That are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant
3				Species Across All Strata:(B)
A				Percent of dominant Species
5.	·			That Are OBL, FACW, or FAC: (A/B)
Total Cover	:			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:	<u> </u>	of Total Cover:	0	Total % Cover of: Multiply by:
 1				OBL Species 20 x 1 = 20
2.				FACW Species $0 \times 2 = 0$
3.				FAC Species 0 $x 3 =$ 0 FACU Species 0 $x 4 =$ 0
4.				
5				
6.	. <u> </u>			Column Totals: <u>20</u> (A) <u>20</u> (B)
7				Prevalence Index = B/A = <u>1.000</u>
8				Hydrophytic Vegetation Indicators:
9	·			✓ Dominance Test is > 50%
10 Total Cover				✓ Prevalence Index is ≤3.0
Herb Stratum50% of Total Cover:		of Total Cover:	0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Arctophila fulva	20	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2	0			¹ Indicators of hydric soil and wetland hydrology must
3				be present, unless disturbed or problematic.
4				
F	-			Plot size (radius, or length x width) <u>r=5m</u>
5	0			% Cover of Wetland Bryophytes (Where applicable)
6	0			
6. 7.				
6 7 8	0			% Bare Ground
6. 7. 8. 9.	0			% Bare Ground _100 Total Cover of Bryophytes _0
6 7 8	0 0 0			% Bare Ground

Depth I	Matrix		Rec	lox Feat	ures			
inches) Color (mo	ist)	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
p	"							
								·
				-				
pe: C=Concentration. D=	Depletion. F	M=Reduce	ed Matrix ² Location	n: PL=Por	re Lining. RO	C=Root Cha	nnel. M=Matrix	
dric Soil Indicators:			Indicators for I					
Histosol or Histel (A1)			Alaska Color (Change (T	A4) ⁴		Alaska Gleved With	out Hue 5Y or Redder
Histic Epipedon (A2)			🗌 Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydrogen Sulfide (A4)			🗌 Alaska Redox	With 2.5Y	' Hue		✓ Other (Explain in R	emarks)
Thick Dark Surface (A12	2)							
Alaska Gleyed (A13)			³ One indicator o	f hydroph	ytic vegetat	ion, one pri	imary indicator of wetla	nd hydrology,
Alaska Redox (A14)			and an appropria	ate landsc	ape position	must be p	resent.	
Alaska Gleyed Pores (Al	15)		⁴ Give details of	color char	nge in Rema	rks.		
							1	
rictive Layer (if present)	:							
Tunor							Hydric Soil Prese	ent? Yes $ullet$ No $igcap$
Type.								
Type: Depth (inches): marks: ndatedassume hydric	: soil						<u> </u>	
Depth (inches): narks: ndatedassume hydric	: soil							
Depth (inches): narks: ndatedassume hydric							Secondary	Indicators (2 or more required)
Depth (inches): larks: datedassume hydric DROLOGY tland Hydrology Indic	ators:	cient)						Indicators (2 or more required) tained Leaves (B9)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any o	ators:	cient)	Inundation	Visible on	Aerial Imaq	ery (B7)	Water S	tained Leaves (B9)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of Surface Water (A1)	ators:	cient)	Inundation				Water S	tained Leaves (B9) e Patterns (B10)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any c	ators:	cient)		getated C			Water S Water S Drainage Oxidized	tained Leaves (B9) e Patterns (B10)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3)	ators:	cient)	Sparsely Ve	getated C ts (B15)	oncave Surf		Water S Water S Drainage Oxidized	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4)
Depth (inches): arks: datedassume hydric DROLOGY Land Hydrology Indic mary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	ators: one is suffic	cient)	Sparsely Ve	getated C ts (B15) ulfide Odo	oncave Surf		Water S Drainage Oxidized Oxidized Presence Salt Dep	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4)
Depth (inches): narks: idatedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3)	ators: one is suffic	cient)	Sparsely Ve	getated C ts (B15) ulfide Odo Water Ta	oncave Surf or (C1) ble (C2)		Water S Drainage Oxidized Oxidized Salt Dep Stunted	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5)
Depth (inches): Marks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4)	ators: one is suffic	cient)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated C ts (B15) ulfide Odo Water Ta	oncave Surf or (C1) ble (C2)		Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of 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)	ators: one is suffic	cient)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated C ts (B15) ulfide Odo Water Ta	oncave Surf or (C1) ble (C2)		Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
Depth (inches): arks: datedassume hydric DROLOGY Cland Hydrology Indic mary Indicators (anv of 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)	ators: one is suffic	cient)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated C ts (B15) ulfide Odo Water Ta	oncave Surf or (C1) ble (C2)		Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop	tained Leaves (B9) e Patterns (B10) l Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inches): arks: datedassume hydric DROLOGY Liand Hydrology Indic mary Indicators (any of 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 d Observations:	ators: one is suffic)		Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expl	getated C ts (B15) ulfide Odo Water Ta ain in Rem	oncave Surf or (C1) ble (C2) narks)		Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
Depth (inches): arks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of 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 d Observations:	ators: one is suffic)) Yes •	No O	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated C ts (B15) ulfide Odo Water Ta ain in Rem	oncave Surf or (C1) ble (C2)		Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): marks: datedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of 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 Id Observations: face Water Present?	ators: one is suffic)		Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expl	getated C ts (B15) ulfide Odc Water Ta ain in Rem	oncave Surf or (C1) ble (C2) narks)	ace (B8)	Water S Drainage Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): Depth (inches): marks: idatedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of 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 Id Observations: face Water Present? ter Table Present? uration Present?	ators: one is suffic)) Yes •	No O	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla	getated C ts (B15) ulfide Odc Water Ta ain in Ren	oncave Surf or (C1) ble (C2) narks)	ace (B8)	Water S Drainagu Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop ✓ FAC-neu	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): harks: hatedassume hydric DROLOGY tland Hydrology Indic mary Indicators (any of 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 Id Observations: face Water Present? ter Table Present? uration Present? uration Present? uration Present?	ators: one is suffic) Yes Yes Yes Yes	No ○ No ④ No ●	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla	getated C ts (B15) ulfide Odc Water Ta ain in Ren thes):	oncave Surf	ace (B8)	Water S Drainagu Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop ✓ FAC-neu	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): narks: ndatedassume hydric DROLOGY etland Hydrology Indic imary Indicators (any of 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) Surface Soil Cracks (B6) Id Observations: face Water Present? ter Table Present? ter Table Present? curation Present? curati	ators: one is suffic) Yes Yes Yes Yes	No ○ No ④ No ●	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla	getated C ts (B15) ulfide Odc Water Ta ain in Ren thes):	oncave Surf	ace (B8)	Water S Drainagu Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop ✓ FAC-neu	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): narks: ndatedassume hydric DROLOGY etland Hydrology Indic imary Indicators (any of 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) Surface Soil Cracks (B6) Surface Soil Cracks (B6) Id Observations: face Water Present? ter Table Present? ter Table Present? curation Present?	ators: one is suffic)) Yes Yes auge, moni	No No No No Itor well, a	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla	getated C ts (B15) ulfide Odc Water Ta ain in Ren thes):	oncave Surf	ace (B8)	Water S Drainagu Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop ✓ FAC-neu	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
Depth (inches): harks: harks: hatedassume hydrice DROLOGY tland Hydrology Indice mary Indicators (any of 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 Id Observations: face Water Present? ter Table Present? turation Present? curation	ators: one is suffic)) Yes Yes auge, moni	No No No No Itor well, a	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla	getated C ts (B15) ulfide Odc Water Ta ain in Ren thes):	oncave Surf	ace (B8)	Water S Drainagu Oxidized Presence Salt Dep Stunted Geomor Shallow Microtop ✓ FAC-neu	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)

PUBH

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1), FAC-neutral Test (D5).



Project	/Site: Barrow Environmental Obseratory	Bo	orough/City:	North Slop	pe Borough Sampling Date:29-Jul-15_	
Applica	ant/Owner: UIC				Sampling Point: BEO-11	
Investig	gator(s): SLI, EKJ	L	_andform (hills	side, terrac	e, hummocks etc.): Flat	
Local r	elief (concave, convex, none): none		Slope: 0.0		a-	
Subreg	ion : Northern Alaska	Lat.: 7	1.282403333	 3333	 Long.: -156.5088266666667 Datum: WGS8	4
-	p Unit Name:				NWI classification: PEM1F	
	natic/hydrologic conditions on the site typical for this ti	me of vear?	yes (• No O	(If no, explain in Remarks.)	
			disturbed?		ormal Circumstances" present? Yes	
		naturally pro			ded, explain any answers in Remarks.)	
	MARY OF FINDINGS - Attach site map show	• ·				
	drophytic Vegetation Present? Yes \odot No \bigcirc	ang sam			·	
	dric Soil Present? Yes			-	oled Area	
-	etland Hydrology Present? Yes No		wit	hin a We	etland? Yes \odot No \bigcirc	
		w tundra po	onds here are	larger, may	y be mapped separately (not as part of complex). wet	
T Com	sedge tundra a mix of E and F water regimes, b				is the reason there isn't standing water at time of site	
	visit. abundant goose scat, feathers.					
VEGE	TATION - Use scientific names of plants. Li	ct all coo	ciac in that			
	TATION - Ose scientific hames of plants. Li	•	•		Deminente Testanolation	
Tr	ee Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species	
1.					That are OBL, FACW, or FAC:4 (A)	1
2.					Total Number of Dominant	
3.					Species Across All Strata:(B)	
4.					Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/	'B)
5.						
	Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by:	
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20%	of Total Cover:	0		
1.	Salix pulchra	0.1	\checkmark	FACW	OBL Species 50.1 x 1 = 50.1 FACW Species 0.3 x 2 = 0.600	
2.	Salix ovalifolia	0.1	\checkmark	FAC	FAC Species $0.1 \times 3 = 0.300$	
3.		0			FACU Species $0 \times 4 = 0$	
4.					UPL Species $0 \times 5 = 0$	
5.						21
6.		-			Column Totals: <u>50.5</u> (A) <u>51</u> (E	5)
7.		0			Prevalence Index = B/A = <u>1.010</u>	
8.		0			Hydrophytic Vegetation Indicators:	
		0			✓ Dominance Test is > 50%	
10.	Total Cover				✓ Prevalence Index is \leq 3.0	
н	erb Stratum		of Total Cover:	0.04	Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet)	in
1.		30		OBL	Problematic Hydrophytic Vegetation ¹ (Explain)	
2.	Eriophorum scheuchzeri	15		OBL	¹ Indicators of hydric soil and wetland hydrology must	
3.	Arctophila fulva	5		OBL	be present, unless disturbed or problematic.	
4.	Saxifraga cernua	0.1		FACW		
5.	Saxifraga foliolosa	0.1		FACW	Plot size (radius, or length x width) r=15m	
6.	Saxifraga hirculus	0.1		OBL	% Cover of Wetland Bryophytes	-
7.					(Where applicable)	
8.					% Bare Ground60	
9.					Total Cover of Bryophytes35	1
10.		0			Hydrophytic	
	Total Cover		of Total Course	10.00	Vegetation Present? Yes • No ·	
-	50% of Total Cover: _2			10.06		
Rem	arks: trace pedicularis, dupfis. eriophorum likely a m	ix of erirus	andd erisch.			

		e depth need atrix	ed to docum	ent the indicator or cor Rec	nfirm the ab		cators)		
Depth (inches)	Color (mois	t)	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-4			100					Fibric Organics	
4-13			100					Hemic Organics	
						-			
		enletion P	M-Reduce	d Matrix ² Location	. DI – Dor	e Lining PC		nnel M-Matrix	
Hydric Soil			M-Reduce	Indicators for I		-			
_				Alaska Color C			50115 :		
	or Histel (A1)			Alaska Color C				Alaska Gleyed Without Underlying Layer	Hue 5Y or Redder
·	ipedon (A2)			Alaska Redox				Other (Explain in Rema	arke)
	n Sulfide (A4)				Wiui 2.51	nue			11(5)
	rk Surface (A12)			³ One indicator o	f hydroph	vtic vegetati	ion, one pri	imary indicator of wetland	nydrology.
	leyed (A13) edox (A14)			and an appropria					, - 577
	leyed Pores (A15	`		⁴ Give details of		ao in Domo	-		
	leyeu Fores (AIS)		Give details of		ge in Rena	IKS.		
Restrictive La	ver (if present):								-
	easonal frost							Hydric Soil Present	? Yes 🖲 No 🔾
Depth (ind									
Remarks:	100). 10								
HYDROLO	OGY								
Wetland Hy	drology Indica	tors:						Secondary Inc	licators (2 or more required)
Primary Ind	icators (any or	ne is suffic	ient)					Water Stain	ed Leaves (B9)
Surface	Water (A1)			Inundation V	/isible on	Aerial Imag	ery (B7)	Drainage Pa	atterns (B10)
🖌 High Wa	ter Table (A2)			Sparsely Ve	getated Co	oncave Surfa	ace (B8)	Oxidized Rh	izospheres along Living Roots (C3)
🖌 Saturatio	on (A3)			Marl Deposi	ts (B15)			Presence of	Reduced Iron (C4)
Water M	arks (B1)			Hydrogen S	ulfide Odo	r (C1)		Salt Deposi	rs (C5)
Sedimen	t Deposits (B2)			Dry-Season	Water Tal	ole (C2)		Stunted or	Stressed Plants (D1)
🗌 Drift dep	oosits (B3)			Other (Expla	ain in Rem	arks)		Geomorphic	Position (D2)
	t or Crust (B4)							Shallow Aqu	
Iron Dep	oosits (B5)								aphic Relief (D4)
Surface	Soil Cracks (B6)							✓ FAC-neutra	Test (D5)
Field Observ	vations:	\sim	\sim				_		
Surface Wate	r Present?	Yes \bigcirc	No 🖲	Depth (inc	hes):				
Water Table F	Present?	Yes 🖲	No \bigcirc	Depth (inc	hes):	1	Wet	and Hydrology Prese	nt? Yes $ullet$ No $igodom$
Saturation Pre (includes capi		Yes 🖲	No \bigcirc	Depth (inc	hes):	0			
Recorded Da	ata (stream ga	uge, moni	tor well, a	erial photo, previ	ous inspe	ection), if a	available:		_
Remarks:									
temp 38 ec 860									

PEM1F

Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



Project/Sit	e: Barrow Environmental C			ATION DAT		- Alaska Region pe Borough Sampling Date: 29-Jul-15
	Owner: UIC	,, ,				Sampling Point: BEO-12
nvestigato	-		l	andform (hill	side, terrac	e, hummocks etc.): Pond
-		concave		Slope: 0.0	%/ 0.0	
Subreaion	Northern Alaska		Lat.: 7	1.282403333	3333	Long.: -156.508183333333 Datum: 0
-	Init Name:			1.202 100000		NWI classification: PEM2H
	ic/hydrologic conditions on the	site typical for th	his time of year?	Yes	• No ()	(If no, explain in Remarks.)
Are Vege Are Vege	etation , Soil , o etation , Soil , o	or Hydrology	significantlynaturally pro	disturbed? blematic?	Are "N (If nee	ormal Circumstances" present? Yes No O ded, explain any answers in Remarks.)
	phytic Vegetation Present?	Yes O No				•
	Soil Present?	Yes No	_		-	oled Area
•	nd Hydrology Present?	Yes No	-	wit	hin a We	etland? Yes \odot No \bigcirc
	s: shallow tundra pond with s			PEM2H code	arcful is he	pavily grazed
/EGET/	ATION - Use scientific na	mes of plants	s. List all spec	cies in the	•	Dominance Test worksheet:
Tree	Stratum		% Cover	Species?	Status	Number of Dominant Species
1.						That are OBL, FACW, or FAC: <u>2</u> (A)
2.						Total Number of Dominant Species Across All Strata: 2 (B)
3.						Percent of dominant Species
4.						That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
5.						Prevalence Index worksheet:
		Total Co				Total % Cover of: Multiply by:
Sapling	J /Shrub Stratum 50	% of Total Cover:	20% (of Total Cover:	0	OBL Species <u>32.1</u> x 1 = <u>32.1</u>
						FACW Species $0 \times 2 = 0$
2						FAC Species 0 x 3 = 0
3						FACU Species <u>0</u> x 4 = <u>0</u>
4 5						UPL Species x 5 =
						Column Totals: <u>32.1</u> (A) <u>32.1</u> (B)
6 7.						
-						Prevalence Index = B/A = <u>1.000</u>
						Hydrophytic Vegetation Indicators:
						Dominance Test is > 50%
-		Total Co				✓ Prevalence Index is ≤3.0
Herb	Stratum_50	% of Total Cover:	20%	of Total Cover	0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Ar	ctophila fulva		25	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Ca	arex aquatilis		7		OBL	¹ Indicators of hydric soil and wetland hydrology must
3. <u>Hi</u>	ppuris vulgaris		0.1		OBL	be present, unless disturbed or problematic.
						Plot size (radius, or length x width) <u>r=5m</u>
6						% Cover of Wetland Bryophytes (Where applicable)
7						% Bare Cround 100
7 8						% Bare Ground
7 8 9			0			Total Cover of Bryophytes
7 8 9			0			Total Cover of Bryophytes
7 8 9			0 0 0 0 0 32.1	of Total Cover:	6.42	Total Cover of Bryophytes

		e depth neede atrix	ed to docume	ent the indicator or cor Rec	nfirm the ab		ators)		
Depth (inches)	Color (mois	t)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
				,					
¹ Type: C=Co	ncentration. D=D	epletion. RI	M=Reduced	d Matrix ² Location	1: PL=Por	re Lining. RC	=Root Cha	nnel. M=Matrix	
Hydric Soil	Indicators:			Indicators for I		-	Soils ³ :		
Histosol	or Histel (A1)			Alaska Color C	Change (T	A4) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
Histic Ep	ipedon (A2)			Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydroge	n Sulfide (A4)			Alaska Redox	With 2.5Y	' Hue		Other (Explain in Rem	arks)
	rk Surface (A12)			20					
	leyed (A13)			³ One indicator o and an appropria				mary indicator of wetland resent.	hydrology,
_	edox (A14)					• •			
Alaska G	leyed Pores (A15)		⁴ Give details of	color char	nge in Remar	ks.		
Restrictive La	yer (if present):								
Type:	, (p							Hydric Soil Presen	t? Yes 🖲 No 🔾
Depth (in	ches):								
HYDROLO	DGY								
Wetland Hy	drology Indica	tors:						Secondary Inc	dicators (2 or more required)
_	licators (any or	ne is suffic	ent)					Water Stair	ned Leaves (B9)
✓ Surface	()			Inundation	visible on	Aerial Image	ery (B7)	_	atterns (B10)
	ter Table (A2)				-	oncave Surfa	ice (B8)		nizospheres along Living Roots (C3)
Saturation	. ,			Marl Deposi	. ,				f Reduced Iron (C4)
Water M				Hydrogen S				Salt Deposi	
	t Deposits (B2) posits (B3)			Dry-Season		. ,			Stressed Plants (D1) c Position (D2)
	it or Crust (B4)			Other (Expla	ain in Rem	narks)		Shallow Aq	· · ·
	posits (B5)							_	raphic Relief (D4)
	Soil Cracks (B6)							FAC-neutra	
Field Observ	()	-	-						X − I
Surface Wate	r Present?	Yes 🖲	No 〇	Depth (inc	hes):	12]		
Water Table	Present?	$_{\rm Yes} \bigcirc$	No 🖲	Depth (inc	hes):		Wet	and Hydrology Prese	ent? Yes $ullet$ No $igodom$
Saturation Pr		Yes \bigcirc	No 🖲	Depth (inc				, ,,	
(includes cap Recorded Da				erial photo, previ	,	ection), if a	vailable:		
omarke									
Remarks: shallow tund	ra pond, estim	ate 12 in c	leep.						
ec 490									
emp 49									

PEM2H Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



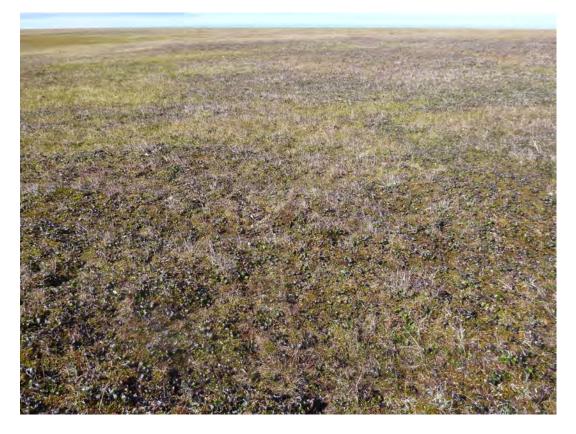
Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1), FAC-neutral Test (D5).



	t/Site: Barrow Environmental Obseratory		ugh/City: North	. M - Alaska Region Slope Borough Sampling Date: 29-Jul-	.15
Applica	ant/Owner: UIC			Sampling Point: BEO-13	
••	gator(s): SLI, EKJ	Lan	dform (hillside ter	race, hummocks etc.): Shoreline	
	relief (concave, convex, none): concave			0.0 ° Elevation: 20	
	gion : Northern Alaska		28470166666667	Long.: -156.505863333333 Datum: WG	GS84
-	ap Unit Name:			NWI classification: PSS1B	
	matic/hydrologic conditions on the site typical for this ti	me of vear?	Yes 💿 No		
		significantly dis		"Normal Circumstances" present? Yes • No	C
		naturally proble		needed, explain any answers in Remarks.)	
21.11/11	MARY OF FINDINGS - Attach site map show				
	· · ·	wing sampin			
			Is the Sa	mpled Area	
-			within a	Wetland? Yes $ullet$ No $igloodow$	
_	etland Hydrology Present? Yes • No U narks: appears to be relic shoreline. high reflectance p	hataain hinhau	in claustice there		
/EGE	TATION - Use scientific names of plants. Li	ist all specie	s in the plot.		
ти	ree Stratum		ominant Indicat Species? Statu		
1.		<u>/// Cover3</u>		Number of Dominant Species That are OBL, FACW, or FAC: 2	(A)
2.				Total Number of Dominant	
3.				Species Across All Strata: 2	(B)
4.				Percent of dominant Species That Are OBL, FACW, or FAC: 100.0%	(A/B)
5.				- Drevelance Index workshoets	
	Total Cover			Prevalence Index worksheet: Total % Cover of: Multiply by:	
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20% of T	otal Cover: 0		
				OBL Species 5 x 1 = 5	
	Salix rotundifolia	60	FAC	FACW Species 26 x 2 = 52	
2.	Solix rotundifolio	1		FACW Species 26 x 2 = 52	
2. 3.	Salix rotundifolia Salix pulchra		FAC	- FACW Species 26 x 2 = 52	
2. 3. 4.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3	
2. 3. 4. 5.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0	(B)
2. 3. 4. 5. 6.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3	(B)
2. 3. 4. 5. 6. 7.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633	(B)
2. 3. 4. 5. 6. 7. 8.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators:	(B)
2. 3. 4. 5. 6. 7. 8. 9.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50%	(B)
2. 3. 4. 5. 6. 7. 8. 9.	Salix rotundifolia Salix pulchra		FAC	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0	
2. 3. 5. 6. 7. 8. 9.	Salix rotundifolia Salix pulchra	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC □ FACW □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ — □ —	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting definition of the support of	
2. 3. 4. 5. 6. 7. 8. 9. 10.	Salix rotundifolia Salix pulchra	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC □ FACW □ —	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting diageneric science)	
2. 3. 4. 5. 6. 7. 8. 9. 10.	Salix rotundifolia Salix pulchra Total Cover 50% of Total Cover:	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FAC FACW FACW FACW Image: State of the state o	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explain)	
2. 3. 4. 5. 6. 7. 8. 9. 10.	Salix rotundifolia Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus	$ \begin{array}{c} 1 \\ 0 $	✓ FAC FACW FACW □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting diageneric science)	
2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2.	Salix rotundifolia Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	✓ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must	
2. 3. 4. 5. 6. 7. 8. 9. 10. 10. H . 1. 2. 3.	Salix rotundifolia Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	✓ FAC FACW □ <	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must	data in
2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6.	Salix rotundifolia Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa Saxifraga hieraciifolia	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	▼ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes	data in
2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7.	Salix rotundifolia Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa Saxifraga hieraciifolia Pedicularis lanata	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	✓ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable)	lata in
2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 8.	Salix rotundifolia Salix pulchra Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa Saxifraga hieraciifolia Pedicularis lanata Poa arctica	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	▼ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable) 15	lata in
2. 3. 4. 5. 6. 7. 8. 9. 10. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9.	Salix rotundifolia Salix pulchra Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa Saxifraga hieraciifolia Pedicularis lanata Dao aretigo	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	✓ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable) 15 % Bare Ground 15 Total Cover of Bryophytes 15	lata in
2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 8.	Salix rotundifolia Salix pulchra Salix pulchra Salix pulchra Total Cover Erb Stratum Petasites frigidus Alopecurus magellanicus Eriophorum angustifolium Saxifraga nelsoniana Luzula confusa Saxifraga hieraciifolia Pedicularis lanata Poa arctica	$ \begin{array}{c} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	✓ FAC FACW FACW □ □	FACW Species 26 $x 2 =$ 52 FAC Species 67.1 $x 3 =$ 201.3 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 98.1 (A) 258.3 Prevalence Index = B/A = 2.633 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting d Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable) 15	lata in

Profile Descript Depth	ion: (Describe to	the depth ne fatrix	eded to doc	ument the in		nfirm the ab		ators)		
(inches)	Color (mo	ist)	%	Color (r	noist)	%	Type 1	Loc ²	Texture	Remarks
0-1			100						Hemic Organics	
1-5	10YR	3/3	80	10YR	4/1	20	C	PL	Silty Clay Loam	
5-13	2.5Y	4/3	85	2.5Y	4/4	15	С	PL	Silty Clay Loam	distinct redox concentrations
13-17	10YR	2/1	100						Silt Loam	high organic content
	······································								·	-
			·						·	
		Depletion	RM=Redu						annel. M=Matrix	
Hydric Soil				_			ntic Hydric	Soils' :	_	
	or Histel (A1)				aska Color C		-		Alaska Gleyed Withou	t Hue 5Y or Redder
	ipedon (A2)			_	aska Alpine : aska Redox '	•			Underlying Layer	and co
	n Sulfide (A4) rk Surface (A12			I Ala	aska keuux	WIUI 2.51	пие		Other (Explain in Rem	
	leyed (A13)	-)		³ One	indicator of	f hydroph	ytic vegetati	ion, one pri	imary indicator of wetland	hydrology,
	edox (A14)					, ,	ape position	<i>'</i>	/	
	leyed Pores (Al	.5)		⁴ Give	e details of o	color char	ige in Rema	rks.		
							5			
Restrictive La	ver (if present)	:								
Type: si	lty clay loam,	seasona	frost						Hydric Soil Presen	t? Yes 🖲 No 🔾
Depth (in	ches): 1, 13									
HYDROLO		-							Coccerdent In	diantana (2 an manua naguinad)
-	drology Indic		(initial states)							dicators (2 or more required)
	licators (any (one is sut	ricient)			(initial and	A suist Tass s			ned Leaves (B9)
	Water (A1) ter Table (A2)						Aerial Imagoncave Surfa			atterns (B10) hizospheres along Living Roots (C3)
Saturatio	. ,				Marl Deposit	-	Uncave Suna	ace (bo)		f Reduced Iron (C4)
	arks (B1)				Hydrogen Si	• •	or (C1)		Salt Depos	
	t Deposits (B2))			Dry-Season					Stressed Plants (D1)
	osits (B3)) Other (Expla		. ,		Geomorphi	c Position (D2)
🗌 Algal Ma	t or Crust (B4)								✓ Shallow Aq	uitard (D3)
	oosits (B5)									raphic Relief (D4)
Surface	Soil Cracks (B6)							✓ FAC-neutra	al Test (D5)
Field Observ		Yes 🤇	No	0				-		
Surface Wate					Depth (inc	hes):				
Water Table I		Yes 🤇		y .	Depth (inc	hes):		Wet	and Hydrology Pres	ent? Yes 🖲 No 🔾
Saturation Pro (includes cap		Yes 🤇	No C)	Depth (inc	hes):	13]		
Recorded Da	ata (stream g	auge, mo	nitor well	aerial pl	noto, previ	ous insp	ection), if a	available:		
Remarks:	loam, seaso	nal freet								
sily udy udy	Juan, Seaso	nai must								

PSS1B Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: No hydric soil indicators. Wetland Hydrology Indicators: Shallow Aquitard (D3), FAC-neutral Test (D5).



Project/Site: Barrow Environmental Obseratory	Boro	ough/City:	North Slop	pe Borough Sampling Date: 29-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-14
Investigator(s): SLI, EKJ	Lar	าdform (hil	lside, terrac	e, hummocks etc.): Flat
Local relief (concave, convex, none):none	Sk	ope: 0.0	%/ 0.0	elevation: 40
Subregion : Northern Alaska	Lat.: 71.:	28249666	66667	Long.: -156.521195 Datum: WGS84
Soil Map Unit Name:				NWI classification: PEM1B
Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology SUMMARY OF FINDINGS - Attach site map sh	significantly dia	sturbed? ematic?	(If nee	(If no, explain in Remarks.) lormal Circumstances" present? Yes ● No ○ eded, explain any answers in Remarks.)
		ls	the Samp	pled Area
		wi	thin a We	etland? Yes $ullet$ No $iglood$
	nlot characterizi	na hiah ca	nter polygor	n. troughs and low center polys as at previously sampled
vet sedge tundra. common goose and caribo	List all specie	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum	% Cover	Species?	Status	Number of Dominant Species
1.				That are OBL, FACW, or FAC: (A) Total Number of Dominant
2				Species Across All Strata:3(B)
3.				Percent of dominant Species
4 5				That Are OBL, FACW, or FAC: 100.0% (A/B)
5				Prevalence Index worksheet:
		Total Cover		Total % Cover of: Multiply by:
		_		OBL Species <u>21</u> x 1 = <u>21</u>
1. Salix pulchra			FACW	FACW Species <u>!####;</u> x 2 = <u>16.40</u>
2				FAC Species 20 x 3 = 60
				FACU Species x 4 =
				UPL Species x 5 =
				Column Totals: <u>49.2</u> (A) <u>97.40</u> (B)
7				Prevalence Index = B/A = 1.980
8.	0			
9.				Hydrophytic Vegetation Indicators:
10.	0			Dominance Test is > 50%
Total Cov	er: 5			Prevalence Index is ≤3.0
_Herb Stratum50% of Total Cover:	2.5 20% of ⁻		r: <u>1</u>	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Carex aquatilis			OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Luzula nivalis			FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. Luzula confusa			FAC	be present, unless disturbed or problematic.
4. Eriophorum russeolum			FACW	
5. Eriophorum angustifolium			OBL	Plot size (radius, or length x width) <u>r=5m</u>
6. Saxifraga foliolosa			FACW	% Cover of Wetland Bryophytes (Where applicable)
7. Saxifraga cernua			TACW	% Bare Ground <u>45</u>
8				TJ
	Ω			Total Cover of Bryophytes 50
9 10	0			Total Cover of Bryophytes <u>50</u>

Remarks: salix at shoulder of high center poly

Total Cover: _____44.2__

50% of Total Cover: <u>22.1</u> 20% of Total Cover:

Yes 💿 No 🔾

Present?

8.84

rofile Description: (Describe to Depth	4atrix	I	Redox Feat	ures			
(inches) Color (mo	ist) %	Color (moist)	%	Type 1	Loc ²	Texture	Remarks
0-4	100	l				Hemic Organics	
4-7 10YR	2/2 100					Silty Clay Loam	
7-12	100	· · · · · · · · · · · · · · · · · · ·			<u>.</u>	Hemic Organics	
						· .	
Type: C=Concentration. D=	Depletion. RM=	Reduced Matrix ² Loca	tion: PL=Po	re Lining. RC	C=Root Cha	nnel. M=Matrix	
ydric Soil Indicators:		Indicators fo	or Problema	atic Hydric	Soils ³ :		
Histosol or Histel (A1)		Alaska Cole	or Change (T	A4) ⁴		Alaska Gleyed With	out Hue 5Y or Redder
 Histic Epipedon (A2) 		🔄 Alaska Alpi	ne swales (T	A5)		Underlying Layer	
Hydrogen Sulfide (A4)		Alaska Rec	ox With 2.51	(Hue		Other (Explain in R	emarks)
Thick Dark Surface (A12	2)	30				in a start a st	and buildening
Alaska Gleyed (A13)		One indicato and an appro				imary indicator of wetla resent.	nd hydrology,
Alaska Redox (A14)							
Alaska Gleyed Pores (A1	.5)	⁴ Give details	of color char	nge in Rema	rks.		
estrictive Layer (if present)							
Type: silty clay loam,		:				Hydric Soil Pres	ent? Yes \bullet No \bigcirc
Depth (inches): 4, 12							
Depth (inches): 4, 12							
Depth (inches): 4, 12							
Depth (inches): 4, 12							
Depth (inches): 4, 12 marks:							
Depth (inches): 4, 12 marks:							
Depth (inches): 4, 12 marks: /DROLOGY /etland Hydrology Indic	ators:						Indicators (2 or more required)
Depth (inches): 4, 12 marks: /DROLOGY /etland Hydrology Indic rimary Indicators (any of	ators:					Water S	tained Leaves (B9)
Depth (inches): 4, 12 marks: (DROLOGY etland Hydrology Indic rimary Indicators (any of Surface Water (A1)	ators:	Inundati	on Visible on	-		Water S	tained Leaves (B9) e Patterns (B10)
Depth (inches): 4, 12 marks: (DROLOGY etland Hydrology Indic rimary Indicators (any of Surface Water (A1) High Water Table (A2)	ators:	Inundati	Vegetated C	-		Water S	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3)
Depth (inches): 4, 12 marks: (DROLOGY etland Hydrology Indic rimary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3)	ators:	Inundati	Vegetated C osits (B15)	oncave Surfa		Water S Water S Crainag Oxidized Presence	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4)
Depth (inches): 4, 12 marks: /DROLOGY etland Hydrology Indic rimary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	ators: one is sufficien	Inundati	Vegetated C osits (B15) n Sulfide Odo	oncave Surfa or (C1)		Water S Water S Drainag Oxidized Presenc Salt Dep	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5)
Depth (inches): 4, 12 marks: /DROLOGY /etland Hydrology Indic rimary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas	Vegetated C osits (B15) n Sulfide Odo on Water Ta	oncave Surfa or (C1) ble (C2)		Water S Drainag Oxidized Presenc Salt Dep Stunted	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1)
Depth (inches): 4, 12 marks: YDROLOGY Yetland Hydrology Indic trimary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3)	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas	Vegetated C osits (B15) n Sulfide Odo	oncave Surfa or (C1) ble (C2)		Water S Water S Drainag Oxidized Presenc Salt Deg Stunted Geomor	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2)
Depth (inches): 4, 12 emarks: YDROLOGY /etland Hydrology Indic Primary Indicators (any of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4)	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas	Vegetated C osits (B15) n Sulfide Odo on Water Ta	oncave Surfa or (C1) ble (C2)		Water S Water S Drainag Oxidized Presend Salt Deg Stunted Geomor V Shallow	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inches): 4, 12 marks: /DROLOGY /etland Hydrology Indic rimary Indicators (any of 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)	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas	Vegetated C osits (B15) n Sulfide Odo on Water Ta	oncave Surfa or (C1) ble (C2)		Water S Drainag Oxidized Presence Salt Dep Stunted Geomor ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
Depth (inches): 4, 12 marks: /DROLOGY /etland Hydrology Indic rimary Indicators (any of 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)	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas	Vegetated C osits (B15) n Sulfide Odo on Water Ta	oncave Surfa or (C1) ble (C2)		Water S Drainag Oxidized Presence Salt Dep Stunted Geomor ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inches): 4, 12 marks: YDROLOGY Vetland Hydrology Indic rimary Indicators (any of 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 ield Observations:	ators: one is sufficien	Inundati Sparsely Arr Hydroge Dry-Seas Other (E	Vegetated C osits (B15) n Sulfide Odd on Water Ta xplain in Ren	oncave Surfa or (C1) ble (C2)		Water S Drainag Oxidized Presence Salt Dep Stunted Geomor ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
Depth (inches): 4, 12 marks: YDROLOGY retland Hydrology Indic rimary Indicators (any of 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 ield Observations: urface Water Present?	ators: one is sufficien	Inundati Sparsely Marl Dep Hydroge Dry-Seas Other (E	Vegetated C osits (B15) n Sulfide Odo on Water Ta xplain in Ren (inches):	oncave Surfa or (C1) ble (C2)	ace (B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 marks: YDROLOGY Yetland Hydrology Indic Primary Indicators (any of 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 ield Observations: urface Water Present? Vater Table Present?	ators: one is sufficien	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa or (C1) ble (C2) narks)	ace (B8)	Water S Drainag Oxidized Presence Salt Dep Stunted Geomor ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 emarks: YDROLOGY Vetland Hydrology Indic Primary Indicators (any of 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 ield Observations: urface Water Present? Water Table Present? aturation Present? aturation Present?	ators: one is sufficien	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E No ● Depth No ● Depth No ● Depth	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa	(B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 emarks: YDROLOGY Yetland Hydrology Indic Primary Indicators (any of 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 ield Observations: urface Water Present? Atter Table Present? aturation Present? aturation Present? aturation Present?	ators: one is sufficien	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E No ● Depth No ● Depth No ● Depth	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa	(B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 emarks: YDROLOGY Yetland Hydrology Indic Primary Indicators (any of 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 ield Observations: urface Water Present? /ater Table Present? aturation Present?	ators: one is sufficien	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E No ● Depth No ● Depth No ● Depth	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa	(B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 marks: (DROLOGY (etland Hydrology Indic rimary Indicators (any o 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 etd Observations: urface Water Present? aturation Present? aturation Present? aturation Present? aturation Present? aturation Present? aturation Present? aturation Algal Mat or Crust (B4) Conded Data (stream generation) Ecorded Data (stream generation)	ators: one is sufficien Yes O M Yes M Yes M auge, monitor	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E No ● Depth No ● Depth No ● Depth	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa	(B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)
Depth (inches): 4, 12 marks: (DROLOGY etland Hydrology Indic rimary Indicators (any of 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 eld Observations: urface Water Present? ater Table Present?	ators: one is sufficien Yes O M Yes M Yes M auge, monitor	□ Inundatii □ Sparsely □ Marl Dep □ Hydroge □ Dry-Seas □ Other (E No ● Depth No ● Depth No ● Depth	Vegetated C osits (B15) n Sulfide Odd on Water Ta kplain in Ren (inches):	oncave Surfa	(B8)	Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-net	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) utral Test (D5)

PEM1B

Wetland Functional Class: Seasonally Flooded-Saturated Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Saturation (A3), Shallow Aquitard (D3), FAC-neutral Test (D5).



	prough/City:	1001111 310	pe Borough Sampling Date: 29-Jul-15
			Sampling Point: BEO-15
L	_andform (hills	side, terrac	e, hummocks etc.): Flat
	Slope: 0.0	%/ 0.0	Elevation: 15
Lat.: 7	1.280553333	3333	Long.: -156.520485 Datum: WGS84
_			NWI classification: PEM2F
ne of year?	Yes	• No ()	(If no, explain in Remarks.)
		Are "N	lormal Circumstances" present? Yes
			eded, explain any answers in Remarks.)
ing sam	pling point	locations	s, transects, important reatures, etc.
	ls t	he Sam	oled Area
		-	
grazed arcf	ul.		ontinuous moss cover, otherwise standing water with algae
st all spe	cies in the	plot.	
Absolute	Dominant	Indicator	Dominance Test worksheet:
% Cover	Species?	Status	Number of Dominant Species
			That are OBL, FACW, or FAC: <u>2</u> (A)
			Total Number of Dominant Species Across All Strata: 2 (B)
			Percent of dominant Species
			That Are OBL, FACW, or FAC:(A/B)
			Prevalence Index worksheet:
	of Total Cover		Total % Cover of: Multiply by:
020%6		0	OBL Species 40 x 1 = 40
			FACW Species $0 \times 2 = 0$
			FAC Species $0 \times 3 = 0$
			FACU Species $0 \times 4 = 0$
			UPL Species $0 \times 5 = 0$
			UPL Species 0 x 5 = 0
			UPL Species $0 \times 5 = 0$ Column Totals: 40 (A) 40 (B)
			UPL Species 0 x 5 = 0
			UPL Species $0 \times 5 = 0$ Column Totals: 40 (A) 40 (B)
			UPL Species $0 x 5 = 0$ Column Totals: <u>40</u> (A) <u>40</u> (B) Prevalence Index = B/A = <u>1.000</u>
			UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators:
 	of Total Cover:		UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 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)
 		 OBL	UPL Species0x 5 =0Column Totals:40(A)40(B)Prevalence Index = $B/A =$ 1.000Hydrophytic 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)
 0 20% (_		UPL Species0x 5 =0Column Totals:40(A)40(B)Prevalence Index = $B/A = 1.000$ Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
 020% (OBL	UPL Species0x 5 =0Column Totals:40(A)40(B)Prevalence Index = $B/A = 1.000$ Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain)
0 0 0 0 0 0 0 0 0 0 0 0 0 0		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 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) Indicators of hydric soil and wetland hydrology must
 		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark 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. Plot size (radius, or length x width) $r=15m$
 		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 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. Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes
0 20% 0 30 10 0 0 0 0 0 0 0 0 0		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 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. Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable)
0 20% 30 10 0 0 0 0 0 0 0 0 0 0 0 0 0		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: Image: Constraint of the state of t
		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 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. Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes (Where applicable) % Bare Ground % Bare Ground 5 Total Cover of Bryophytes 90
0 0 0 0 0 0 0 0 0 0 0 0 0 0		OBL	UPL Species 0 x 5 = 0 Column Totals: 40 (A) 40 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: Image: Constraint of the state of t
	Lat.: 7 ne of year? ignificantly naturally proving sam strine fring grazed arcf st all spece <u>Absolute</u> <u>% Cover</u> 0 20%	Slope: 0.0 Lat.: 71.280553333 me of year? Yes ignificantly disturbed? naturally problematic? ving sampling point Is t wit ustrine fringe wetland wit grazed arcful. St all species in the Absolute Dominant % Cover Species? 0 20% of Total Cover: 0 20% of Total Cover:	Lat.: 71.2805533333333

WETLAND DETERMINATION DATA FORM - Alaska Region

Depth	Ма			Rec	lox Featu	ires		_	
(inches)	Color (moist))	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-5			100					Fibric Organics	
5-6			100					Hemic Organics	
6-8			100	,	-		-	Sapric Organics	
8-9			100					Sapric Organics	with mineral inclusions
9-14	10Y 4	4/1	100					Silty Clay Loam	
									_
									_
								<u></u>	
			M_Doduce	ed Matrix ² Location					
Hydric Soil 1		epietion. R	M=Reduce	Indicators for F				annei. M=Matrix	
				_			50115 :		
	or Histel (A1)			Alaska Color C		-		 Alaska Gleyed Withou Underlying Layer 	It Hue 5Y or Redder
=	pedon (A2)			Alaska Alpine				Other (Explain in Rer	narke)
	n Sulfide (A4) rk Surface (A12)				WIUI 2.51	nue			iidiks)
	eyed (A13)			³ One indicator o	f hydroph	ytic vegetat	ion, one pr	imary indicator of wetland	l hydrology,
	edox (A14)			and an appropria					
	eyed Pores (A15))		⁴ Give details of	color chan	ige in Rema	rks.		
								1	
Restrictive Lay	ver (if present):								
Type: sil	ty clay loam, se	easonal f	rost					Hydric Soil Preser	nt? Yes 🖲 No 🔾
	L 0 . 1.4								
Depth (inc Remarks:	nes): 9, 14								
Remarks:									
Remarks: HYDROLO	DGY	ors						Socondary II	udicators (2 or more required)
Remarks: HYDROLO Wetland Hyd)GY Irology Indicate		riont)						ndicators (2 or more required)
Remarks: HYDROLO Wetland Hyd	DGY Irology Indicate		cient)		/isible.on	Aorial Imag	on: (87)	Water Sta	ined Leaves (B9)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V	Irology Indicate icators (any one Water (A1)		cient)	Inundation \		5	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10)
Remarks: HYDROLO Wetland Hyd Primary Indi V Surface V High Wat	OGY Irology Indicate icators (any one Nater (A1) ter Table (A2)		cient)	Sparsely Ve	getated Co	5	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V V High Wat Saturatio	DGY Irology Indicate icators (any one Nater (A1) ter Table (A2) on (A3)		cient)	Sparsely Veg	getated Co ts (B15)	oncave Surf	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V V High Wat Saturatio Water Ma	DGY Irology Indicate icators (any one Nater (A1) ter Table (A2) on (A3) arks (B1)		cient)	Sparsely Veg	getated Co ts (B15) ulfide Odo	oncave Surf	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment	DGY Irology Indicator icators (any one Water (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2)		cient)	Sparsely Veg Marl Deposit Hydrogen St	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Gaturatio Water Ma Sediment Drift dep	DGY Irology Indicator icators (any one Water (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3)		cient)	Sparsely Veg	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) hic Position (D2)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment Drift dep Algal Mat	DGY Irology Indicator icators (any one Water (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4)		cient)	Sparsely Veg Marl Deposit Hydrogen St	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta Drainage Oxidized F Presence Salt Depo Stunted o Geomorph Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wate Saturatio Water Ma Sediment Drift dep Algal Mat Iron Dep	DGY Irology Indicate icators (any one Nater (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5)		cient)	Sparsely Veg Marl Deposit Hydrogen St	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta Drainage Oxidized F Presence G Salt Depos Stunted o ✓ Geomorph Shallow A Microtopo	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wate Saturatio Water Ma Sediment Drift dep Algal Mat Iron Dep	DGY Irology Indicator icators (any one Nater (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6)		cient)	Sparsely Veg Marl Deposit Hydrogen St	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta Drainage Oxidized F Presence Salt Depo Stunted o Geomorph Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Mater Ma Sediment Drift dep Algal Mat Iron Dep Surface S	DGY Irology Indicator icators (any one Nater (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations:		cient)	□ Sparsely Veq □ Marl Deposi ☑ Hydrogen St □ Dry-Season □ Other (Expland)	getated Co ts (B15) ulfide Odo Water Tal ain in Rem	oncave Surf or (C1) ble (C2)	, 、 ,	Water Sta Drainage Oxidized F Presence G Salt Depos Stunted o ✓ Geomorph Shallow A Microtopo	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment Drift dep Algal Mat Iron Dep Surface S Field Observ Surface Water	DGY Irology Indicator icators (any one Nater (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: Present?	e is suffic Yes •	No O	☐ Sparsely Veg ☐ Marl Deposit ☑ Hydrogen St ☐ Dry-Season ☐ Other (Expla	getated Ca ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 3	ace (B8)	Water Sta Drainage Oxidized F Presence G Salt Depor Stunted or ✓ Geomorph Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment Drift dep Algal Mat Iron Dep Surface S Field Observ	DGY Irology Indicato icators (any one Nater (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: Present?	e is suffic Yes Yes	No () No ()	☐ Sparsely Veg ☐ Marl Deposi ☑ Hydrogen St ☐ Dry-Season ☐ Other (Expla Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem hes):	oncave Surfa	ace (B8)	Water Sta Drainage Oxidized F Presence G Salt Depos Stunted o ✓ Geomorph Shallow A Microtopo	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment Algal Mat Iron Dep Surface S Field Observ Surface Water Water Table P Saturation Pre (includes capil	DGY Irology Indicator icators (any one Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: Present? esent? llary fringe)	e is suffic Yes Yes Yes Yes	No () No () No ()	☐ Sparsely Veg ☐ Marl Deposit ☑ Hydrogen St ☐ Dry-Season ☐ Other (Expla Depth (inc Depth (inc Depth (inc	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	3 0 0 0	C (B8)	Water Sta Drainage Oxidized F Presence G Salt Depor Stunted or ✓ Geomorph Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Remarks: HYDROLO Wetland Hyd Primary Indi Surface V High Wat Saturatio Water Ma Sediment Algal Mat Iron Dep Surface S Field Observ Surface Water Water Table P Saturation Pre (includes capil	DGY Irology Indicator icators (any one Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: Present? esent? llary fringe)	e is suffic Yes Yes Yes Yes	No () No () No ()	☐ Sparsely Veg ☐ Marl Deposi ☑ Hydrogen St ☐ Dry-Season ☐ Other (Expla Depth (inc Depth (inc	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	3 0 0 0	C (B8)	Water Sta Drainage Oxidized F Presence G Salt Depor Stunted or ✓ Geomorph Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)

PEM2F Wetland Functional Class: Lacustrine Fringe Graminoid Marsh Wildlife Habitat: Aquatic Graminoid Marsh



Hydric Soil Indicators: Histic Epipedon (A2), Hydrogen Sulfide (A4). Wetland Hydrology Indicators: Surface water (A1), High Water Table (A2), Saturation (A3).



WETLAND D Project/Site: Barrow Environmental Obseratory		ON DATA FOR gh/City: North S	M - Alaska Region
Applicant/Owner: UIC		lform (billoido tor	Sampling Point: BEO-16
Investigator(s): SLI, EKJ		norm (minside, ten e: 0.0 % /	race, hummocks etc.): <u>Swale</u> 0.0 ° Elevation: 15
Local relief (concave, convex, none): <u>concave</u>	· · ·		
Subregion : Northern Alaska	Lat.: 71.28	3261	Long.:156.53846 Datum: WGS84
Soil Map Unit Name:			NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology	significantly distrinaturally problem	matic? (If r	"Normal Circumstances" present? Yes No No
SUMMARY OF FINDINGS - Attach site map sho	wing samplin	g point locatio	
		Is the Sa	mpled Area
Hydric Soil Present? Yes ● No ○		within a \	Wetland? Yes \odot No \bigcirc
Wetland Hydrology Present? Yes No Remarks: swale connecting drained lake basin to Ikpik S			
/EGETATION - Use scientific names of plants. I	List all species	in the plot.	
		minant Indicat	
Tree Stratum 1.	% Cover Sp	pecies? Status	S Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
2			Total Number of Dominant
3			Species Across All Strata: (B)
A			Percent of dominant Species
5.			That Are OBL, FACW, or FAC: (A/B)
Total Cove	er:		Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:	20% of To	tal Cover:0	Total % Cover of: Multiply by:
1.			OBL Species <u>30</u> x 1 = <u>30</u>
1. 2.			FACW Species <u>10.1</u> x 2 = <u>20.20</u>
3.			- FAC Species 0 x 3 = 0
4.			FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0
5.			_
6.			Column Totals: <u>40.1</u> (A) <u>50.20</u> (B)
7.			Prevalence Index = B/A = <u>1.252</u>
8			 Hydrophytic Vegetation Indicators:
9			 ✓ Dominance Test is > 50%
10			$\checkmark \qquad \qquad$
Total Cove 		otal Cover: 0	 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
1. Carex aquatilis	20	✓ OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Eriophorum angustifolium	10	✓ OBL	Indicators of hydric soil and wetland hydrology must
3. Eriophorum russeolum	10	✓ FACW	be present, unless disturbed or problematic.
4. Dupontia fischeri	0.1	FACW	
5.	-		Plot size (radius, or length x width) <u>r=5m</u>
6	0		% Cover of Wetland Bryophytes
7	0		(Where applicable)
		└┘	% Bare Ground
8			
8 9	0		Total Cover of Bryophytes98
9. 10.	0		Hydrophytic
9	0 0 9 r: 40.1	tal Cover: 8.02	 Hydrophytic Vegetation Present? Yes No O Yes No

Profile Descripti	•	e depth need atrix	ed to docume	ent the indicator or con	firm the ab		cators)		
Depth (inches)	Color (mois		 %	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-2			100			Туре	LOC	Fibric Organics	
2-6			100					Hemic Organics	
6-7								Silty Clay Loam	
	2.51	·	100						
			100					Hemic Organics	
¹ Type: C=Cor	centration. D=D	Depletion. R	M=Reduced	Matrix ² Location	: PL=Por	e Lining. R	C=Root Cha	nnel. M=Matrix	
Hydric Soil				Indicators for P					
Histosol d	or Histel (A1)			Alaska Color C	hange (TA	44) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
✓ Histic Epi	. ,			Alaska Alpine	swales (TA	45)		Underlying Layer	
	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rema	arks)
Thick Dar	rk Surface (A12)								
🗌 Alaska Gl	eyed (A13)							imary indicator of wetland	hydrology,
🗌 Alaska Re	edox (A14)			and an appropria	te landsca	ape position	i must be p	resent.	
🗌 Alaska Gl	eyed Pores (A15	5)		⁴ Give details of o	color chan	ge in Rema	irks.		
								1	
-	ver (if present):							Unduio Coll Duocout	
Type: se	asonal frost							Hydric Soil Present	t? Yes 🖲 No 🔿
Depth (inc	:hes): 13								
Remarks:									
HYDROLC									
-	Irology Indica								licators (2 or more required)
	icators (any or	ne is suffic	ient)						ned Leaves (B9)
_	Water (A1)			Inundation \		-		_	atterns (B10)
	ter Table (A2)			Sparsely Veg		oncave Surf	ace (B8)		nizospheres along Living Roots (C3)
Saturatio	. ,			Marl Deposit	. ,				Reduced Iron (C4)
	arks (B1)			Hydrogen Su				Salt Deposi	()
_	t Deposits (B2)			Dry-Season		. ,			Stressed Plants (D1)
	osits (B3)			Other (Expla	in in Rem	arks)		Geomorphic	· · /
	t or Crust (B4)							Shallow Aqu	
	osits (B5) Soil Cracks (B6)							FAC-neutral	raphic Relief (D4)
Field Observ	()								
Surface Water		$_{ m Yes}$ \bigcirc	No 🖲	Depth (inc	hes):				
		Yes •	No O		-		 		
Water Table F Saturation Pre				Depth (inc	hes):	1	Weti	and Hydrology Prese	ent? Yes 🖲 No 🔾
(includes capi		Yes 🖲	No 〇	Depth (inc	hes):	0			
Recorded Da	ita (stream ga	uge, moni	tor well, a	erial photo, previ	ous inspe	ection), if	available:		
Remarks:									
	veen E and F h	iydro code	s. very dry	/ year, water at s	urface, h	ence F.			
temp 42 ec 380									
D2swale									
D3silty clay	loam, season	al frost							

Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Geomorphic Position (D2).



PEM1F

Project/Site: Barrow Environmental Obseratory		A FORM - Alaska Region North Slope Borough Sampling Date: 29-Jul-15
Applicant/Owner: UIC		Sampling Point: BEO-17
nvestigator(s): SLI, EKJ	Landform (hills	ide, terrace, hummocks etc.): Swale
ocal relief (concave, convex, none): concave	Slope: 0.0	% / 0.0 ° Elevation: 15
ubregion : Northern Alaska	Lat.: 71.2826666666	
oil Map Unit Name:		NWI classification: PUBH
re climatic/hydrologic conditions on the site typical for this time	e of year? Yes	No O (If no, explain in Remarks.)
Are Vegetation 🗌 , Soil 🗌 , or Hydrology 🗌 sig	nificantly disturbed?	Are "Normal Circumstances" present? Yes $oldsymbol{igstar}$ No $igstar$
Are Vegetation 🗌 , Soil 🗹 , or Hydrology 🗌 na	turally problematic?	(If needed, explain any answers in Remarks.)
UMMARY OF FINDINGS - Attach site map showi	na samplina point l	locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		· · · · ·
Hydric Soil Present? Yes		he Sampled Area
Wetland Hydrology Present? Yes \bigcirc No \bigcirc	with	hin a Wetland? Yes $ullet$ No $igodoldoldoldoldoldoldoldoldoldoldoldoldol$
Remarks: open water in swale connecting drained lake basir	n to Ikpik Slough. see B	EO-16 for adjacent wet sedge tundra.
EGETATION - Use scientific names of plants. List	all species in the r	plot.
· · · ·	Absolute Dominant	
	% Cover Species?	Status Number of Dominant Species
1		That are OBL, FACW, or FAC: (A)
2.	H	Total Number of Dominant Species Across All Strata: (B)
3		Percent of dominant Species
4 5		That Are OBL, FACW, or FAC:00.0% (A/B)
Total Cover:	0	Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:0	20% of Total Cover:	Total % Cover of: Multiply by:
1		OBL Species $5 \times 1 = 5$
2.		FACW Species 0 x 2 = 0
3.		$\begin{array}{c c}$
4		UPL Species 0 x 5 = 0
5	<u> </u>	
6.		
7		Prevalence Index = B/A = <u>1.000</u>
8		Hydrophytic Vegetation Indicators:
9 10		□ Dominance Test is > 50%
Total Cover:	0	Prevalence Index is ≤3.0
Herb Stratum 50% of Total Cover:0	20% of Total Cover:	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Arctophila fulva	5	OBL Problematic Hydrophytic Vegetation ¹ (Explain)
2		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3.		
4		
5. 6.		Plot size (radius, or length x width) <u>1m x 5m</u> Cover of Wetland Bryophytes
7	0	(Where applicable)
	0	% Bare Ground 99
8	0	Total Cover of Bryophytes
	0	Hydrophytic
8 9		Hydrophytic Vegetation

Profile Description: (Describe to t	1atrix			lox Featu	ires	,		
Depth (inches) Color (moi	ist)	% 0	Color (moist)	%	Type 1	Loc 2	Texture	Remarks
·								
¹ Type: C=Concentration. D=	Depletion. R	M=Reduced					annel. M=Matrix	
Hydric Soil Indicators:			Indicators for F			Soils ³ :		
Histosol or Histel (A1)			Alaska Color C	hange (T	A4) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
Histic Epipedon (A2)			Alaska Alpine	swales (T/	A5)		Underlying Layer	
Hydrogen Sulfide (A4)			🗌 Alaska Redox	With 2.5Y	Hue		✓ Other (Explain in Rem	arks)
Thick Dark Surface (A12	2)							
Alaska Gleyed (A13)							imary indicator of wetland	hydrology,
Alaska Redox (A14)			and an appropria	ite landsca	ape position	must be p	present.	
Alaska Gleyed Pores (A1	.5)		⁴ Give details of	color chan	ige in Rema	rks.		
Restrictive Layer (if present):								
Туре:							Hydric Soil Present	t? Yes 🖲 No 🔾
Depth (inches):								
Remarks:							1	
inundatedassume hydric	soil							
	_							
Wetland Hydrology Indica								licators (2 or more required)
Primary Indicators (any c		ient)					Water Stair	ned Leaves (B9)
Wetland Hydrology Indica Primary Indicators (any of surface Water (A1)		ient)	Inundation \		-		Water Stair	ed Leaves (B9) atterns (B10)
Wetland Hydrology Indicators Primary Indicators (any or strength of the strengt of the strength of the strength of the streng		ient)	Sparsely Ve	getated Co	-		Water Stair Water Stair Drainage P Oxidized R	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3)
Wetland Hydrology Indicators Primary Indicators (any of surface Water (A1) High Water Table (A2) Saturation (A3)		ient)	Sparsely Veg	getated Co ts (B15)	oncave Surf		Water Stair Urainage P Oxidized R P Presence of	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4)
Wetland Hydrology Indicators Primary Indicators (any of surface Water (A1) ✓ Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	one is suffic	ient)	Sparsely Ve	getated Co ts (B15)	oncave Surf		Water Stair Drainage P Oxidized Ri Presence of Salt Deposi	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5)
Wetland Hydrology Indicators Primary Indicators (any of surface Water (A1) High Water Table (A2) Saturation (A3)	one is suffic	ient)	Sparsely Veg	getated Co ts (B15) ulfide Odo	oncave Surf		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi	ed Leaves (B9) atterns (B10) izospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1)
Wetland Hydrology Indicators Primary Indicators (any of surface Water (A1) ✓ Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	one is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen St	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stair Drainage P Oxidized Ri Presence of Salt Deposi	ed Leaves (B9) atterns (B10) izospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1)
Wetland Hydrology Indicators Primary Indicators (any of a straight of a stra	one is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2)
Wetland Hydrology Indicators Primary Indicators (any of a stress of a st	one is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
Wetland Hydrology Indicators Primary Indicators (any of a stress of a st	one is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi Stunted or Geomorphi Shallow Aq	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
Wetland Hydrology Indicators Primary Indicators (any of a stress of a st)		Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
Wetland Hydrology Indicators Primary Indicators (any of 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)	one is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal ain in Rem	oncave Surf or (C1) ble (C2)		Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
Wetland Hydrology Indicators Primary Indicators (any of 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))	No O	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) Jlfide Odo Water Tal ain in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present?) Yes Yes Yes	No 〇 No ④	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	ace (B8)	Water Stair Water Stair Drainage P Oxidized R Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present?) Yes •	No O	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present?	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present? Water Table Present? Recorded Data (stream gain Remarks:	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Recorded Data (stream gaing) Remarks: bottom visible in places	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
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Wetland Hydrology Indicators Primary Indicators (any of 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Recorded Data (stream gain Remarks: bottom visible in places D2swale temp 53	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
Wetland Hydrology Indicators Primary Indicators (any of a straight of the st	Yes Yes Yes Yes Yes Yes	No ○ No ● No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Co ts (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 16	ace (B8)	Water Stair Drainage P. Oxidized Ri Presence of Salt Deposi Stunted or ✓ Geomorphi Shallow Aq Microtopog ✓ FAC-neutra	ed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3) F Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)

PUBH Wetland Functional Class: Lakes and Ponds Wildlife Habitat: Shallow Open Water without Islands



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1), Geomorphic Position (D2), FAC-neutral Test (D5).

No Photo

roject/Site:	Barrow Environmen	tal Obseratory	E	Borough/City:	North Slop	pe Borough Sampling Date: 29-Jul-1	5
pplicant/Ow	ner: UIC					Sampling Point: BEO-18	
vestigator(s): SLI, EKJ			Landform (hil	lside, terrac	e, hummocks etc.): Flat	
ocal relief (c	oncave, convex, none): none		Slope: 0.0	% / 0.0	• Elevation: 15	
ubregion :	Northern Alaska		Lat.:	71.284275		Long.: -156.536633333333 Datum: WGS	384
il Map Unit			-			NWI classification: PEM1B	
		the site typical for this	time of vear	·? Yes	• No ()	(If no, explain in Remarks.)	
Are Vegetat			•	y disturbed?	Are "N	ormal Circumstances" present? Yes No	
Are Vegetat				roblematic?		eded, explain any answers in Remarks.)	
0							
			wing san	npling point	locations	s, transects, important features, etc.	
Hydrophy	tic Vegetation Present			ls	the Samp	oled Area	
Hydric So	il Present?	Yes 🕘 No 🔾			thin a We		
	Hydrology Present?	Yes 🔍 No 🔾					
	microtine burrows.	c names of plants. I	-			t sedge tundra, with a few pss1b areas as at BEO-13	<u>, ma</u>
-02////	on ose scienting		•			Dominance Test worksheet:	
Tree Stra	atum		Absolute % Cover		Indicator Status	Number of Dominant Species	
1.							(A)
2.						Total Number of Dominant	-
<u> </u>							(B)
1						Percent of dominant Species That Are OBL, FACW, or FAC: 100.0%	(A/B)
5.							
		Total Cove	r:			Prevalence Index worksheet: Total % Cover of: Multiply by:	
Sapling/Sl	hrub Stratum	50% of Total Cover:	0 20%	of Total Cover	0		
1.						OBL Species 20 x 1 = 20	
•						FACW Species <u>17.2</u> x 2 = <u>34.40</u> FAC Species <u>11.2</u> x 3 = <u>33.60</u>	
-							
						$\begin{array}{c c} FACU \text{ Species } \underline{0} & x \ 4 = \underline{0} \\ \text{UPL Species } 0 & x \ 5 = \underline{0} \end{array}$	
F							
6.						Column Totals: <u>48.4</u> (A) <u>88.00</u>	(B)
7						Prevalence Index = B/A = <u>1.818</u>	
8						Hydrophytic Vegetation Indicators:	
9						Dominance Test is > 50%	
10						✓ Prevalence Index is ≤3.0	
_Herb Str	atum	Total Cove 50% of Total Cover:	_	6 of Total Cover	:	Morphological Adaptations ¹ (Provide supporting da Remarks or on a separate sheet)	ta in
	sites frigidus		15	\checkmark	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)	
	horum angustifolium		10		OBL	¹ Indicators of hydric soil and wetland hydrology must	
	victico		10		FAC	be present, unless disturbed or problematic.	
•.	< aquatilis		10	\checkmark	OBL		
5. Alope	curus magellanicus		2		FACW	Plot size (radius, or length x width) $r=5m$	
6. Luzul	a confusa		1		FAC	% Cover of Wetland Bryophytes	_
7. Stella	ria longipes		0.1	_	FAC	(Where applicable)	_
8. Saxifi	aga hieraciifolia		0.1		FAC	% Bare Ground	
	aga foliolosa		0.1		FACW	Total Cover of Bryophytes95	_
9. Saxifi			0.1		FACW	Hydrophytic	
	raga cernua				-		
	aga cernua	Total Cove 50% of Total Cover:	r: <u>48.4</u>	of Total Cover		Vegetation Present? Yes • No ·	

WETLAND DETERMINATION DATA FORM - Alaska Region

Profile Description	•	1atrix				ox Featu				
(inches)	Color (moi	ist)	%	Color (m	noist)	%	$Type^1$	Loc 2	Texture	Remarks
0-3			100						Hemic Organics	
3-7	2.5Y	3/2	90	7.5YR	3/3	10	С	PL	Silty Clay	C includes oxidized rhizospheres at living
7-11		-	100						Hemic Organics	
						-			·	
						-				
Type: C=Con	centration. D=	Depletion.	RM=Reduc	ed Matrix	² Location:	PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
Hydric Soil 1	Indicators:			_	ators for Pr			Soils ³ :		
	or Histel (A1)				ska Color Ch		-			out Hue 5Y or Redder
 Histic Epi 	pedon (A2)				ska Alpine sv				Underlying Layer	
	n Sulfide (A4)			🔄 Ala	ska Redox W	/ith 2.5Y	Hue		Other (Explain in Re	emarks)
	rk Surface (A12	2)		3 000	indicator of	hudroph	utic voqotati	on ono nr	imany indicator of world	nd hydrology
	eyed (A13)				n appropriat				imary indicator of wetla resent.	na nyarology,
_	edox (A14)	F)		4						
Alaska Gl	eyed Pores (A1	.5)		⁴ Give	details of co	olor chan	ige in Remai	rks.		
Actrictive Low	ver (if present):									
-	ty clay, sease								Hydric Soil Prese	ent? Yes $ullet$ No $igcap$
	ily liay, seasi	mai nost								
	(hoc) 2 11									
Depth (inc emarks:	ches): 3, 11 assume an a	dditional	inch of fro	ozen orga	nics					
Depth (inc emarks:		dditional	inch of frc	ozen orga	nics					
Depth (inc emarks: ozen at 11,	assume an a	dditional	inch of frc	ozen orga	nics				<u> </u>	
Depth (inc emarks: ozen at 11, YDROLC	assume an a		inch of frc	ozen orga	nics				Secondary	Indicators (2 or more required)
Depth (inc emarks: ozen at 11, YDROLO Vetland Hyc Primary Ind	assume an a OGY frology Indica icators (any c	ators:							Water S	tained Leaves (B9)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyd Primary Indi Surface V	assume an a OGY Irology Indica icators (any c Water (A1)	ators:			nundation Vi		5	, , ,	Water S	tained Leaves (B9) e Patterns (B10)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Y High Wat	assume an a OGY Irology Indica icators (any c Water (A1) ter Table (A2)	ators:			nundation Vi iparsely Vege	etated Co	5	, , ,	Water Si	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Y High Wat Saturatio	assume an a OGY Irology Indica icators (any c Water (A1) ter Table (A2) on (A3)	ators:			nundation Vi sparsely Vege 1arl Deposits	etated Co (B15)	oncave Surfa	, , ,	Water Si Drainage Oxidized Presence	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V V High Wal Saturatio Saturatio Water Ma	assume an a DGY trology Indica icators (any o Water (A1) ter Table (A2) on (A3) arks (B1)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits Iydrogen Sul	etated Co 5 (B15) fide Odo	oncave Surfa r (C1)	, , ,	Water St Drainage Oxidized Presence Salt Dep	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) vosits (C5)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Vetland Hyc Primary Indi Saturatio Saturatio Water Ma Sedimeni	assume an a DGY trology Indica icators (any o Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits lydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)	, , ,	Water St Drainage Oxidized Presence Salt Dep Stunted	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V V High Wat V High Wat Saturatio Water Ma Sedimen Drift dep	assume an a DGY drology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits Iydrogen Sul	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)	, , ,	Water St Drainage Oxidized Presence Salt Dep Stunted Geomorp	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Y High Wal Y Saturatio Water Ma Sediment Drift dep Algal Mat	assume an a OGY Irology Indica icators (any c Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) oosits (B3) t or Crust (B4)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits lydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)	, , ,	Water St Drainage Oxidized Presence Salt Dep Stunted Geomorp ✓ Shallow	tained Leaves (B9) e Patterns (B10) l Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Y High Wal Saturatio Water Ma Sedimeni Drift dep Algal Mal Iron Dep	assume an a OGY Irology Indica icators (any c Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) oosits (B3) t or Crust (B4) oosits (B5)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits lydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)	, , ,	Water Si Drainage Oxidized Presence Salt Dep Stunted Geomorp ✓ Shallow Microtop	a Patterns (B10) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
Depth (inc emarks: ozen at 11, YDROLC Yetland Hyc Primary Indi Surface V Vetland Hyc Primary Indi Surface V Vetland Hyc Saturatio Water Ma Sedimeni Drift dep Algal Mai Iron Dep Surface S	assume an a OGY Irology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) iosits (B5) Soil Cracks (B6)	ators: one is suff			nundation Vi sparsely Vege 1arl Deposits lydrogen Sul Dry-Season V	etated Co 5 (B15) Ifide Odo Vater Tal	oncave Surfa or (C1) ble (C2)	, , ,	Water Si Drainage Oxidized Presence Salt Dep Stunted Geomorp ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) l Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
Depth (inc emarks: ozen at 11, YDROLC Vetland Hyc Primary Indi Surface V V High Wat V Saturatio Water Ma Sedimen Drift dep Algal Mat Iron Dep Surface S Steld Observ	assume an a OGY Irology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) iosits (B5) Soil Cracks (B6) rations:	ators: one is suff	icient)		nundation Vi iparsely Vege Jarl Deposits Hydrogen Sul Dry-Season V Dther (Explain	etated Co ; (B15) fide Odo Vater Tal n in Rem	oncave Surfa or (C1) ble (C2)	, , ,	Water Si Drainage Oxidized Presence Salt Dep Stunted Geomorp ✓ Shallow Microtop	a Patterns (B10) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
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Depth (inc emarks: ozen at 11, YDROLC Vetland Hyc Primary Indi Surface V V High Wal Saturatio Saturatio O Trift dep Algal Mal Iron Dep Surface S Surface S Surface Vater Vater Table P	assume an a OGY drology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) iosits (B3) t or Crust (B4) iosits (B5) Soil Cracks (B6) vations: r Present? Present?	ators: one is suff Yes C Yes •	icient)		nundation Vi iparsely Vege Jarl Deposits Hydrogen Sul Dry-Season V Dther (Explain	etated Co ; (B15) fide Odo Vater Tal n in Rem es):	oncave Surfa or (C1) ble (C2)		Water Si Drainage Oxidized Presence Salt Dep Stunted Geomorp ✓ Shallow Microtop	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) oosits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) oographic Relief (D4) tral Test (D5)
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Depth (inc emarks: ozen at 11, VDROLC Vetland Hyc Primarv Indi Surface V Vater Mai Sedimeni Orift dep Algal Mai Drift dep Algal Mai Sedimeni Drift dep Surface Set Field Observ Surface Vater Nater Table P Saturation Pre includes capi	assume an a OGY trology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) iosits (B3) t or Crust (B4) iosits (B5) Soil Cracks (B6) vations: r Present? present?	ators: one is suff Yes Yes Yes Yes	icient)		nundation Vi iparsely Vege Iarl Deposits Iydrogen Sul Dry-Season V Dther (Explain Depth (inch Depth (inch	etated Co ; (B15) fide Odo Vater Tal n in Rem es): es): es):	r (C1) ble (C2) larks) 7 2] Wet	Water St Drainage Oxidized Presence Salt Dep Stunted Geomory ✓ Shallow Microtop ✓ FAC-neutory	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) vosits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) vographic Relief (D4) tral Test (D5)
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Depth (inc emarks: ozen at 11, YDROLC Yetland Hyd Primary Indi Surface V Y High Wate Saturatio Water Ma Sedimen Drift dep Algal Mat Iron Dep Surface S ield Observ urface Water Vater Table P aturation Pre includes capil ecorded Da	assume an a OGY frology Indica icators (any of Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) oosits (B3) t or Crust (B4) iosits (B5) Soil Cracks (B6) Soil Cracks (B6) rations: r Present? llary fringe) ita (stream ga	ators: one is suff Yes Yes Yes Yes	icient)		nundation Vi iparsely Vege Iarl Deposits Iydrogen Sul Dry-Season V Dther (Explain Depth (inch Depth (inch	etated Co ; (B15) fide Odo Vater Tal n in Rem es): es): es):	r (C1) ble (C2) larks) 7 2] Wet	Water St Drainage Oxidized Presence Salt Dep Stunted Geomory ✓ Shallow Microtop ✓ FAC-neutory	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) oosits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) oographic Relief (D4) tral Test (D5)

Wetland Functional Class: Seasonally Flooded-Saturated Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



PEM1B

WETLAND DET Project/Site: Barrow Environmental Obseratory	ERMINATION DA Borough/City:	ATA FORM - Alaska Region North Slope Borough Sampling Date: 29-Jul-15
Applicant/Owner: UIC		Sampling Point: BEO-19
Investigator(s): SLI, EKJ	Landform (h	illside, terrace, hummocks etc.): Flat
Local relief (concave, convex, none): concave		0 % / 0.0 ° Elevation: 20
Subregion : Northern Alaska	Lat.: 71.2887966	
Soil Map Unit Name:	11.2001000	NWI classification: PEM1B
Are climatic/hydrologic conditions on the site typical for this tim	e of vear? Ye	$s \odot No \bigcirc$ (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology sig	gnificantly disturbed? aturally problematic?	
SUMMARY OF FINDINGS - Attach site map show	ng sampling poir	nt locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No No		
Hydric Soil Present? Yes		s the Sampled Area vithin a Wetland? Yes $ullet$ No $iglocological No$
Wetland Hydrology Present? Yes No	w	vithin a Wetland? Yes ${}^{igodoldsymbol{ imes}}$ No ${}^{igodoldsymbol{ imes}}$
Remarks: high center polygon community with frost boils. p		
	Absolute Dominant % Cover Species?	Indicator Dominance Test worksheet: Status Number of Dominant Species
		Status Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
2		Total Number of Dominant Species Across All Strata: <u>2</u> (B)
A	H	Percent of dominant Species
5.		That Are OBL, FACW, or FAC: (A/B)
Total Cover:		Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:	20% of Total Cove	Total % Cover of: Multiply by:
		OBL Species 35 x 1 = 35
2.		$\begin{array}{c} \hline \\ FACW Species \underline{2.2} & x 2 = \underline{4.4} \\ FAC Species \underline{1.2} & x 2 = \underline{2.232} \\ \hline \\ \end{array}$
3.		FAC Species 1.3 x 3 = 3.900 FACU Species 0 x 4 = 0
4.		FACU Species 0 x 4 = 0 $ UPL Species 0 x 5 = 0$
5		
6		Column Totals: <u>38.5</u> (A) <u>43.3</u> (B)
7	<u> </u>	Prevalence Index = B/A =1.125
8		Hydrophytic Vegetation Indicators:
9.		Dominance Test is > 50%
10	L	Prevalence Index is ≤3.0
	0 20% of Total Cove	er: Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Eriophorum scheuchzeri	20	OBL Problematic Hydrophytic Vegetation ¹ (Explain)
2. Carex aquatilis	15	OBL ¹ Indicators of hydric soil and wetland hydrology must
3. Petasites frigidus	2	FACW be present, unless disturbed or problematic.
4. Luzula confusa	1	FAC
5. Saxifraga hieraciifolia	0.1	FAC Plot size (radius, or length x width) <u>r=5m</u>
6. Cochlearia officinalis	0.1	FAC % Cover of Wetland Bryophytes
7. Saxifraga cernua	0.1	FACW (Where applicable) FAC % Bare Ground 15
8. Luzula nivalis		
9. Saxifraga foliolosa		
10Total Cover:		Hydrophytic Vegetation
50% of Total Cover:19.		Drocont2 $\operatorname{Vec}(\bullet)$ No()
Remarks: 20% lichen cover		

Depth Interview Color (moist) % Color (moist) % Type ! Loc.2 Texture Remarks 0-4 100
0-4 100 Henic Organics 4-7 10YR 3/3 100 Silt Loam wavy boundary with 7-8 layer 7-8 10YR 2/2 100 Silt Loam silt Loam silt Loam 8-14 100 Henic Organics with mineral inclusions silt Loam silt Loam 8-14 100 Henic Organics with mineral inclusions silt Loam silt Loam 8-14 100 Henic Organics with mineral inclusions silt Loam silt Loam 8-14 100 Henic Organics with mineral inclusions silt Loam silt Loam 8-14 100 Henic Organics with mineral inclusions silt Loam silt Loam 7/per Concentration. D=Depletion. RM=Reduced Matrix 2 Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soil Indicators: Hydric Soil Present Henic Organics 1/per Studie (A1) Alaska Alpine swales (TA5) Indicator of Netder Color Change (TA1)* Alaska Gleyed Without Hue SY or Redder Underlying Layer 1/per Studie (A13) alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Studie (A14) Alaska Gleyed Pores (A15) 4 Give details
7-8 10YR 2/2 100 Sit Loam 8-14 100 Henic Organics with mineral inclusions 8-14 100 Henic Organics with mineral inclusions Type: C=Concentration. D=Depletion. RM=Reduced Matrix Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils ² : Histosol or Histel (A1) Alaska Color Change (TA4)* Hydric Soil Indicators: Indicators for Problematic Hydric Soils ² : Hydric Soil Mide (A4) Alaska Alpine swales (TA5) Histosol or Histel (A1) Alaska Alpine swales (TA5) Hydric Soil Mide (A4) Alaska Alpine swales (TA5) Thick Dark Surface (A12) 3 One indicator of hydrophytic wegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Hydric Soil Present? Yes (a) No (b) Permary. Indicators: Secondary Indicators (2 or more required). Pimary. Indicators (any one is sufficient) Water Stained Leaves (19) Surface Water (A1) Inundation Visible on Aerial Imagery
8-14 100 Hemic Organics with mineral inclusions Type: C=Concentration. D=Depletion. RM=Reduced Matrix 2 Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histos of histel (A1) Alaska Color Change (TA4) ⁴ Histos of visitel (A1) Alaska Alpine swales (TA5) Histos Color Change (TA4) Underlying Layer Hydric Soil Jakaka Color Change (TA4) ⁴ Underlying Layer Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Xestrictive Layer (if present): Type: seasonal frost Hydric Soil Present? Yes (P No () Depth (inches): 14 emarks: Secondary Indicators (2 or more required) Primary. Indicators (any one is sufficient)
Type: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Solls ² : Histos for Indicators: Alaska Color Change (TA4) ⁴ Histos for Indicators: Indicator for Problematic Hydric Solls ² : Histos for problematic Gui Anderson Alaska Gleyed Without Hue 5Y or Redder Histos for problematic Hydric Solls ² : Underlying Layer Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed (A13) ³ One indicator of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Hydric Soil Present? Yes () No () Depth (inches): 14 emarks: Worker Stained Leaves (B9) [] Water Stained Leaves (B9) Surface Water (A1) [] [] Inundation Visible on Aerial Imagery (B7) [] Drainage Patterns (B10)
Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Alaska Gieyed Without Hue 5Y or Redder I Histo Epipedon (A2) Alaska Alpine swales (TA5) Underlying Layer Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) 3 One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gieyed Pores (A15) 4 Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Hydric Soil Present? Yes ● No ○ Wetland Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Innudation Visible on Aerial Imagery (B7) Orainage Patterns (B10)
Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : ☐ Histosol or Histel (A1) ☐ Alaska Color Change (TA4) ⁴ ☐ Alaska Gieyed Without Hue 5Y or Redder ☑ Histic Epipedon (A2) ☐ Alaska Alpine swales (TA5) Underlying Layer ☐ Hydrogen Sulfide (A4) ☐ Alaska Redox With 2.5Y Hue Other (Explain in Remarks) ☐ Thick Dark Surface (A12) ☐ Alaska Redox (With 2.5Y Hue Other (Explain in Remarks) ☐ Alaska Gieyed (A13) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. ☐ Alaska Gieyed Pores (A15) ⁴ Give details of color change in Remarks. Petrictive Layer (if present): Type: seasonal frost Hydric Soil Present? Yes ● No ○ Depth (inches): 14 emarks: WEtand Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Innudation Visible on Aerial Imagery (87) Drainage Patterns (B10)
Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : ☐ Histosol or Histel (A1) ☐ Alaska Color Change (TA4) ⁴ ☐ Alaska Gieyed Without Hue 5Y or Redder ☑ Histic Epipedon (A2) ☐ Alaska Alpine swales (TA5) Underlying Layer ☐ Hydrogen Sulfide (A4) ☐ Alaska Redox With 2.5Y Hue Other (Explain in Remarks) ☐ Thick Dark Surface (A12) ☐ Alaska Redox (With 2.5Y Hue Other (Explain in Remarks) ☐ Alaska Gieyed (A13) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. ☐ Alaska Gieyed Pores (A15) ⁴ Give details of color change in Remarks. Petrictive Layer (if present): Type: seasonal frost Hydric Soil Present? Yes ● No ○ Depth (inches): 14 emarks: WEtand Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Innudation Visible on Aerial Imagery (87) Drainage Patterns (B10)
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Image: State of the state
Image Explosion (ut) Image Explosion (ut) Image Explosion (ut) Image Explosion (ut) Image Hydrogen Sulfide (A4) Image Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Image Thick Dark Surface (A12) 3 One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed (A13) 3 One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Hydric Soil Present? Yes ● No ○ Image Primary Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Image: Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Image: Color Change in Remarks: YDROLOGY No Primary Indicators (any one is sufficient) Primary Indicators (any one is sufficient) Isurface Water (A1) Inundation Visible on Aerial Imagery (B7)
Alaska Gleyed (A13) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Redox (A14) ⁴ Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 emarks:
Alaska Redox (A14) Alaska Gleyed Pores (A15) Give details of color change in Remarks. Alaska Gleyed Pores (A15) Give details of color change in Remarks. Hydric Soil Present? Yes No Hydric Soil Present? Yes No Vestinad Hydrology Indicators: Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Present? Primary Indicators: Primary Indicators (any one is sufficient) Primary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Type: seasonal frost Depth (inches): 14 emarks: IVDROLOGY No No Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Type: seasonal frost Depth (inches): 14 emarks: IVDROLOGY No No Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Depth (inches): 14 emarks: IYDROLOGY Metland Hydrology Indicators: Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
emarks:
IYDROLOGY Wetland Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Water Stained Leaves (B9) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Wetland Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Water Stained Leaves (B9) Surface Water (A1) Inundation Visible on Aerial Imagery (B7)
Primary Indicators (any one is sufficient) Water Stained Leaves (B9) Drainage Patterns (B10)
Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15) Presence of Reduced Iron (C4)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (C5)
Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1)
Drift deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2)
Algal Mat or Crust (B4) Shallow Aquitard (D3)
Iron Deposits (B5)
□ Surface Soil Cracks (B6)
Field Observations:
Surface Water Present? Yes O No O Depth (inches):
Water Table Present? Yes No Depth (inches): 10 Wetland Hydrology Present? Yes No No
Water Table Present? Yes No Depth (inches): 10 Saturation Present? Yes No Depth (inches): 2
Saturation Present?
Saturation Present? Yes No Depth (inches): 2 Recorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: emarks: I3seasonal frost emp 33
Saturation Present? Yes No Depth (inches): 2 Recorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: emarks: P3seasonal frost
Saturation Present? Yes No Depth (inches): 2 Recorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: emarks: I3seasonal frost emp 33

Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



PEM1B

Project					- Alaska Region pe Borough Sampling Date: 29-Jul-15
Applica	nt/Owner: UIC				Sampling Point: BEO-20
nvestig	gator(s): SLI, EKJ	La	andform (hill	side, terrac	e, hummocks etc.): Flat
_ocal r	elief (concave, convex, none): _concave	S	lope: 0.0	%/ 0.0	Elevation: 20
Subreg	ion : Northern Alaska	Lat.: 71	.28879		Long.: -156.526413333333 Datum: WGS84
Soil Ma	p Unit Name:				NWI classification: PEM1H
Are clin	natic/hydrologic conditions on the site typical for this t	time of year?	Yes	• No ()	(If no, explain in Remarks.)
Are V	egetation 🗌 , Soil 🗌 , or Hydrology 🗌	significantly d	listurbed?	Are "N	lormal Circumstances" present? Yes $ullet$ No $igodot$
Are V	egetation 🗌 , Soil 🗌 , or Hydrology 🗌	naturally prob	ematic?	(If nee	ded, explain any answers in Remarks.)
SUMN	IARY OF FINDINGS - Attach site map sho	wing samp	lina point	locations	s, transects, important features, etc.
	drophytic Vegetation Present? Yes No	<u></u>			·
	dric Soil Present? Yes ● No ○			-	oled Area
-	tland Hydrology Present? Yes No		wit	hin a We	etland? Yes \bullet No \bigcirc
	arks: troughs of high center polygonal tundra.				
/EGE	TATION - Use scientific names of plants. L	ist all speci	es in the	plot.	
			Dominant		Dominance Test worksheet:
Tr	ee Stratum	% Cover	Species?	Status	Number of Dominant Species
1.					That are OBL, FACW, or FAC: (A)
2.					Total Number of Dominant Species Across All Strata: 2 (B)
3.					Percent of dominant Species
4. 5.					That Are OBL, FACW, or FAC: (A/B)
5.	Total Cove	r:			Prevalence Index worksheet:
San	ling/Shrub Stratum 50% of Total Cover:		Total Cover:	0	Total % Cover of: Multiply by:
					OBL Species <u>30.1</u> x 1 = <u>30.1</u>
1. 2.					FACW Species <u>0.1</u> x 2 = <u>0.200</u>
3.					FAC Species $0 \times 3 = 0$
4.					FACU Species 0 x 4 = 0
5.					UPL Species x 5 =
6.					Column Totals: <u>30.2</u> (A) <u>30.30</u> (B)
7.					Prevalence Index = B/A = <u>1.003</u>
					Hydrophytic Vegetation Indicators:
					✓ Dominance Test is > 50%
10.					✓ Prevalence Index is \leq 3.0
<u>_H</u>	erb Stratum50% of Total Cover:	_	Total Cover:	0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1.	Eriophorum angustifolium	20	\checkmark	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
	Carex aquatilis	10		OBL	¹ Indicators of hydric soil and wetland hydrology must
3.	Eriophorum russeolum	0.1		FACW	be present, unless disturbed or problematic.
1 .	Arctophila fulva			OBL	
		٥			Plot size (radius, or length x width)
5.		0			% Cover of Wetland Bryophytes
5. 6.					(Where applicable)
5. 6. 7.		0			(Where applicable) % Bare Ground 99
5. 6. 7. 8.		0			
5. 6. 7. 8. 9.		0			% Bare Ground 99 Total Cover of Bryophytes 0
5. 6. 7. 8. 9.		0 0 0 0			% Bare Ground99

		e depth nee atrix	eded to docu	ment the indicator or co	onfirm the ab		ators)		
Depth (inches)	Color (mois		%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-2		-	100					Fibric Organics	
2-6			100				-	Hemic Organics	
6-8		3/3	100				-	Silty Clay Loam	
8-12			100					Hemic Organics	
12-16	5Y	3/2	90	10Y 3/1	10	RM	M	Silty Clay Loam	
		5/2							
				,					
17 0.0									
Hydric Soil I		Depletion.	RM=Reduc	ed Matrix ² Location Indicators for				annel. M=Matrix	
				Alaska Color			30115 :		
Histosof o	r Histel (A1)			Alaska Color		-		Alaska Gleyed Without Underlying Layer	Hue 5Y or Redder
	Sulfide (A4)			Alaska Redox				Other (Explain in Rema	arks)
	k Surface (A12)								,
	eyed (A13)							rimary indicator of wetland	hydrology,
	dox (A14)			and an appropri	ate landsc	ape position	must be p	present.	
🗌 Alaska Gle	eyed Pores (A15	j)		⁴ Give details of	color chan	ige in Rema	rks.		
	er (if present):							Undrie Ceil Dresent	
	asonal frost							Hydric Soil Present	:? Yes 🖲 No 🔿
Depth (inc	hes): 16								
HYDROLO	GY								
Wetland Hyd	rology Indica	tors:						Secondary Inc	licators (2 or more required)
Primary Indi	cators (any or	ne is suff	icient)					Water Stair	ed Leaves (B9)
Surface V	Vater (A1)			Inundation	Visible on	Aerial Imag	ery (B7)	Drainage Pa	atterns (B10)
🖌 High Wat	. ,			Sparsely Ve	egetated Co	oncave Surfa	ace (B8)		izospheres along Living Roots (C3)
Saturatio				Marl Depos	• •				Reduced Iron (C4)
Water Ma				Hydrogen S				Salt Deposi	
Drift dep	t Deposits (B2)			Dry-Season		• •			Stressed Plants (D1) c Position (D2)
	or Crust (B4)			Other (Expl	ain in Rem	iarks)		Shallow Aqu	. ,
									raphic Relief (D4)
	Soil Cracks (B6)							FAC-neutra	
Field Observ	. ,								
Surface Water	Present?	Yes 🖲	\sim No \odot	Depth (in	ches):	4			
Water Table P	resent?	Yes 🖲) No C	Depth (in	ches):	0	Wet	land Hydrology Prese	nt? Yes $ullet$ No $igodom$
Saturation Pre		Yes 🖲	No O		· _	0			
(includes capil Recorded Dat				aerial photo, prev			availahle		
	a (sa cam ga	uge, 1101	neor wen,				aranabic.		
Remarks:									
C4biogenic									
D3seasonal	frost								
temp 55 ec 780									

PEM1H Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Surface Water (A1), High Water Table (A2), Saturation (A3).



,	t/Site: Barrow Environmental Obseratory		gh/City: North S	M - Alaska Region lope Borough Sampling Date: 29	9-Jul-15
Applica	ant/Owner: UIC				0-21
	gator(s): SLI, EKJ	Land	lform (hillside, terr	ace, hummocks etc.): Flat	
	relief (concave, convex, none): concave			0.0 ° Elevation: 20	
Subrea	jion : Northern Alaska	Lat.: 71.28			WGS84
-	ap Unit Name:	11.20		NWI classification: PEM1E	
	natic/hydrologic conditions on the site typical for this til	me of vear?	Yes 🔍 No 🤇		
Are V	/egetation 🗌 , Soil 🗌 , or Hydrology 🗌 s	significantly dist	urbed? Are	"Normal Circumstances" present? Yes 🖲	No \bigcirc
Are V	/egetation	naturally probler	matic? (If n	eeded, explain any answers in Remarks.)	
SUMN	MARY OF FINDINGS - Attach site map show	ving samplin	g point locatio	ns, transects, important features, etc.	
Hyd	drophytic Vegetation Present? Yes $ullet$ No $igodom$		le the Sar	npled Area	
Нус	dric Soil Present? Yes $oldsymbol{igstar}$ No $igstar$		within a V		
We	etland Hydrology Present? Yes $oldsymbol{igodol}$ No $igodol$		within a v		
	aarks: mosaic of ponds and wet sedge tundra. ETATION - Use scientific names of plants. Li	st all species	in the plot.		
	•		, minant Indicato	Dominance Test worksheet:	
	ree Stratum	% Cover Sr	pecies? Status		(4)
1.				That are OBL, FACW, or FAC: <u>3</u> Total Number of Dominant	(A)
2. 3.				- Species Across All Strata:3	(B)
4.				Percent of dominant Species	
5.				That Are OBL, FACW, or FAC: 100.00	%(A/B)
	Total Cover:	0		Prevalence Index worksheet:	
1					
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20% of To	tal Cover:0	Total % Cover of: Multiply by:	
	ling/Shrub Stratum 50% of Total Cover:		ntal Cover: <u>0</u> FAC	Total % Cover of: Multiply by: OBL Species <u>25</u> x 1 = <u>2</u>	25
1.	Soling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To		Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ FACW Species 5 $x 2 =$ 1	10
1.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia	0 20% of To	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1	10 18
1. 2.	Soling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To 5 1 0	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0	10 18 0
1. 2. 3.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia	0 20% of To 5 1 0 0 	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0	10 18 0 0
1. 2. 3. 4.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia	0 20% of To 5 1 0 0 	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0	10 18 0
1. 2. 3. 4. 5.	Jing/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0	10 18 0 0 53 (B)
1. 2. 3. 4. 5. 6. 7. 8.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5	10 18 0 0 53 (B)
1. 2. 3. 4. 5. 6. 7. 8. 9.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472	10 18 0 0 53 (B)
1. 2. 3. 4. 5. 6. 7. 8. 9.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	FAC	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472 Hydrophytic Vegetation Indicators:	10 18 0 0 53 (B)
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC □ FAC □	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50%	LO L8 O 53 (B) 2
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Salix ovalifolia Salix rotundifolia Salix rotundifolia Salix rotundifolia Total Cover: 50% of Total Cover:	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC □ FAC □	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide support	L0 L8 0 53 (B) 2 rting data in
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC □ FAC □	Total % Cover of:Multiply by:OBL Species25 $x 1 =$ 2FACW Species5 $x 2 =$ 1FAC Species6 $x 3 =$ 1FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explanation function func	L0 L8 0 0 53 (B) 2 rting data in
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia Salix rotundifolia </td <td>0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL</td> <td>Total % Cover of:Multiply by:OBL Species25$x 1 =$2FACW Species5$x 2 =$1FAC Species6$x 3 =$1FACU Species0$x 4 =$0UPL Species0$x 5 =$0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators:Dominance Test is > 50%Prevalence Index is ≤ 3.0Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet)</td> <td>L0 L8 0 0 53 (B) 2 rting data in</td>	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL	Total % Cover of:Multiply by:OBL Species25 $x 1 =$ 2FACW Species5 $x 2 =$ 1FAC Species6 $x 3 =$ 1FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators:Dominance Test is > 50%Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet)	L0 L8 0 0 53 (B) 2 rting data in
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 10. 1. 2. 3.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species25 $x 1 =$ 2FACW Species5 $x 2 =$ 1FAC Species6 $x 3 =$ 1FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators:Dominance Test is > 50%Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explation 1)Indicators of hydric soil and wetland hydrology of the second	L0 L8 0 0 53 (B) 2 rting data in
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 10. He 3. 4. 5.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species25 $x 1 =$ 2FACW Species5 $x 2 =$ 1FAC Species6 $x 3 =$ 1FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explation 1) 1 Indicators of hydric soil and wetland hydrology is present, unless disturbed or problematic.	L0 L8 0 0 53 (B) 2 rting data in
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 10. He 1. 2. 3. 4. 5. 6.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FACU Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explation 1) 1 Indicators of hydric soil and wetland hydrology to present, unless disturbed or problematic.Plot size (radius, or length x width) $_{T=}$ % Cover of Wetland Bryophytes	L0 L8 0 0 53 (B) 2 rting data in ain) must
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7.	sling/Shrub Stratum 50% of Total Cover: Salix ovalifolia Salix rotundifolia Solid of Total Cover:	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of: Multiply by: OBL Species 25 x 1 = 2 FACW Species 5 x 2 = 1 FAC Species 6 x 3 = 1 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 36 (A) 5 Prevalence Index = B/A = 1.472 Hydrophytic Vegetation Indicators: Image: Column and the second and the s	L0 L8 0 0 53 (B) 2 rting data in ain) must =5m
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FAC Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = $B/A =$ 1.472 Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explant the present, unless disturbed or problematic.Plot size (radius, or length x width) $r=$ $\%$ Cover of Wetland Bryophytes (Where applicable) 50 $\%$ Bare Ground 50	L0 L8 0 0 53 (B) 2 rting data in ain) must =5m
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. He 1. 2. 3. 4. 5. 6. 7. 8. 9.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species25x 1 =2FACW Species5x 2 =1FAC Species6x 3 =1FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:36(A)5Prevalence Index = B/A =1.472Hydrophytic Vegetation Indicators:Dominance Test is > 50%Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explanting the present, unless disturbed or problematic.Plot size (radius, or length x width)r=% Cover of Wetland Bryophytes4% Bare Ground54Total Cover of Bryophytes45	L0 L8 0 0 53 (B) 2 rting data in ain) must =5m
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. He 1. 2. 3. 4. 5. 6. 7. 8. 9.	sling/Shrub Stratum 50% of Total Cover: Salix rotundifolia	0 20% of To 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	✓ FAC ✓ FAC ✓ FAC ✓ ✓ ✓ ✓ ✓ OBL ✓ OBL	Total % Cover of:Multiply by:OBL Species 25 $x 1 =$ 2 FACW Species 5 $x 2 =$ 1 FAC Species 6 $x 3 =$ 1 FAC Species 0 $x 4 =$ 0 UPL Species 0 $x 5 =$ 0 Column Totals: 36 (A) 5 Prevalence Index = $B/A =$ 1.472 Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide suppor Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explant the present, unless disturbed or problematic.Plot size (radius, or length x width) $r=$ $\%$ Cover of Wetland Bryophytes (Where applicable) 50 $\%$ Bare Ground 50	L0 L8 0 0 53 (B) 2 rting data in ain) must =5m 0

Profile Description: (Describe to t Depth	latrix			ox Featu				
(inches) Color (moi	st)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-12		100					Hemic Organics	
¹ Type: C=Concentration. D=	Depletion. R	M=Reduced					annel. M=Matrix	
Hydric Soil Indicators:			Indicators for P			Soils [°] :		
Histosol or Histel (A1)			Alaska Color C		-		Alaska Gleyed Without	Hue 5Y or Redder
✓ Histic Epipedon (A2)			Alaska Alpine	•	,		Underlying Layer	
Hydrogen Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rema	arks)
Thick Dark Surface (A12)							
Alaska Gleyed (A13)			³ One indicator of and an appropria				imary indicator of wetland	hydrology,
Alaska Redox (A14)						muse be p		
Alaska Gleyed Pores (A1	5)		⁴ Give details of c	olor chan	ge in Rema	rks.		
Restrictive Layer (if present):							Undrie Ceil Dresent	
Type: seasonal frost							Hydric Soil Present	? Yes 🖲 No 🔿
Depth (inches): 12								
IYDROLOGY								
Wetland Hydrology Indica	ators:						Secondary Inc	licators (2 or more required)
Primary Indicators (any c	ne is suffic	cient)					Water Stain	ed Leaves (B9)
Surface Water (A1)			Inundation V	isible on	Aerial Imag	ery (B7)	🗌 Drainage Pa	atterns (B10)
✓ High Water Table (A2)			Sparsely Veg	etated Co	oncave Surf	ace (B8)	Oxidized Rh	izospheres along Living Roots (C3)
Saturation (A3)			Marl Deposit	s (B15)			Presence of	Reduced Iron (C4)
Water Marks (B1)			🗌 Hydrogen Su	ılfide Odo	r (C1)		Salt Deposi	ts (C5)
Sediment Deposits (B2)			Dry-Season	Water Tal	ole (C2)		Stunted or	Stressed Plants (D1)
Drift deposits (B3)			🗌 Other (Expla	in in Rem	arks)		Geomorphic	Position (D2)
Algal Mat or Crust (B4)							🖌 Shallow Aqı	uitard (D3)
✓ Iron Deposits (B5)							Microtopogi	raphic Relief (D4)
Surface Soil Cracks (B6))						✓ FAC-neutra	Test (D5)
Field Observations:	0	0		_		_		
Surface Water Present?	Yes \bigcirc	No 🖲	Depth (incl	hes):				
Water Table Present?	Yes 🖲	No \bigcirc	Depth (incl	hes):	1	Wetl	land Hydrology Prese	nt? Yes 🖲 No 🔾
Saturation Present? (includes capillary fringe)	Yes 🖲	No \bigcirc	Depth (incl		0		, ,,	
Recorded Data (stream ga	auge, moni	tor well, a	erial photo, previo	ous inspe	ection), if a	available:		
Remarks: B5iron floc D3seasonal frost ec 440 temp 38								

Wetland Functional Class: Seasonally Flooded-Saturated Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5), Shallow Aquitard (D3).



PEM1E

nvestigator(s): SLI, EKJ Landform (hillside, terrace, hummocks etc.): Flat	Project/Site: Barrow Environmental Obseratory	Boro	ugh/City:	North Slo	pe Borough Sampling Date: 29-Jul-15	
cocal relief (concave, convex, none): none Slope: 0.0 % / 0.0 * Elevation: 20 subtregion: Northern Alaska Lat: 71.2922466666677 Long:: 1.56.51903333333 Datum: WG844 We dimatichlydrologic conditions on the site typical for this time of year? Yes ● No ○ (if no, explain in Remarks.) Are Vegetation _, Soli ● or Hydrology significantly disturbed? Are Meeded.explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transacts, important features, etc. Hydrology Present? Yes ● No ○ Hydrology Present? Yes ● No ○ Is the Sampled Area within a Wetland? Yes ● No ○ Wetland Hydrology Present? Yes ● No ○ Is the Sampled Area within a Wetland? No ● Yes Evatum	Applicant/Owner: UIC				Sampling Point: BEO-22	
babelegion : Northern Alaska Lat: 71.28224666666667 Long: -156.51903833333 Datum; WGS84 Soll Mp Unit Name; we chastChythologic conditions on the site bylical for this time of year? Yes ® No ○ (If ne conjala in Remarks.) Are Vegetation □ . Soll □ , or Hydrology □ significantly disturbed? Are "Normal Circumstances" present? Yes ® No ○ No ○ Hydrophytic Vegetation Present? Yes ® No ○ Is the Sampled Area within a Wetland? Yes ® No ○ Hydrophytic Vegetation Present? Yes ® No ○ Is the Sampled Area within a Wetland? Yes ® No ○ Wetland Hydrology Present? Yes ® No ○ Is the Sampled Area within a Wetland? Yes ® No ○ Remarks: nonpattemed funda near coast. few goode scat. Is the Sampled Area within a Wetland? Yes ® No ○ It @ Coast Sampled Area within a Wetland? Yes ® No ○ It @ Societa Areas Nithina & Coast Sampled Area within a Wetland? Yes ® No ○ It @ Societa Areas Nithina & Coast Sampled Area within a Wetland? Yes ® No ○ It @ Societa Areas Nithina & Coast Sampled Area within a Wetland? Yes ® No ○ It @ Societa Areas Nithina & Coast Sampled Area withina & Coast Sampled Area within a Wetland? Yes ® No ○ It @ Soci of total Cover: 0 @ Soci o	Investigator(s): SLI, EKJ	Lan	ndform (hil	lside, terrac	e, hummocks etc.): Flat	
Soli Map Unit Name: WW classification: pEM1B ve details:/pdfolgic conditions on the site typical for this time of year? Yes © No ○ (If no, explain in Remarks.) Are Vegetiation	Local relief (concave, convex, none): none	Slc	ope: 0.0	%/ 0.0	elevation: 20	
Soli Map Unit Name: WW classification: pEM1B ve details:/pdfolgic conditions on the site typical for this time of year? Yes © No ○ (If no, explain in Remarks.) Are Vegetiation	Subregion : Northern Alaska	Lat.: 71 :	29224666	66667	Long.: -156 519038333333 Datum: WGS84	
ve climatic/hydrologic conditions on the site typical for this time of year? Yes No (ff no, explain in Remarks.) Are Vegetation					•	
Are Vegetation . Soil , or Hydrology asturally problematic? Are "Normal Circumstances" present? Yes		time of year?	Ves			
Hydrophylic Vegetation Present? Yes ● No ○ Is the Sampled Area within a Wetland? Yes ● No ○ Wetland Hydrology Present? Yes ● No ○ within a Wetland? Yes ● No ○ Remarks: nonpatterned tundra near coast. few goose scat. Dominant Indicator Dominant Species I	Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology	significantly dis naturally proble	sturbed? ematic?	Are "N (If nee	lormal Circumstances" present? Yes $oldsymbol{O}$ No $igodoldsymbol{O}$ ded, explain any answers in Remarks.)	
Hydric Soli Present? Yes ● No ○ Wetland Hydrology Present? Yes ● No ○ Remarks: nonpatterned tundra near coast. few goose scat. // CGETATION - Use scientific names of plants. List all species in the plot. // Command: Species // Command: Species 1. 2. 3. 4. 5. Total Cover: 0 1. 2. 3. 4. 5. Total Cover: 0 1. 2. 3. 4. 5. Total Cover: 0 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 10.			<u> </u>			
Wetland Hydrology Present? Yes No Within a Wetland? Yes No Remarks: nonpatterned tundra near coast. few goose scat. Image: Status Dominant Indicator Dominant Indicator ZEGETATION - Use scientific names of plants. List all species in the plot. Dominant Indicator Dominant Indicator Dominant Species 1.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			-		
Remarks: nonpatiemed bundra near coast. few goose scat. Federarks: nonpatiemed bundra near coast. few goose scat. Tree Stratum Absolute Dominant Indicator % Cover Species? Dominant Endicator % Cover Species? Tree Stratum Dominant Endicator % Cover Species? Dominant Endicator % Cover Species? Status Dominant Endicator % Cover forminant Species Total Cover: 0 Column Total: 64.2 (A) 93.6 (B) Provience Index estaton 1/(Explain) Total Cover: 0 Total Cover: 0 Column Total: 64.2 (A) 93.6 (B) Provience Index estaton 1/(Explain) Total Cover: 0 Column Total: 64.2 (A) Provide supporting data in Remarks or a separate sheet) <th c<="" td=""><td></td><td></td><td>wi</td><td>thin a We</td><td>\bullettland? Yes \bullet No\bigcirc</td></th>	<td></td> <td></td> <td>wi</td> <td>thin a We</td> <td>\bullettland? Yes \bullet No\bigcirc</td>			wi	thin a We	\bullet tland? Yes \bullet No \bigcirc
/EGETATION - Use scientific names of plants. List all species in the plot. Tree Stratum Absolute Dominant Indicator 1		rat			<u></u>	
1.	VEGETATION - Use scientific names of plants.	•		•	Dominance Test worksheet:	
2		<u>% Cover</u>	Species?	Status		
a.						
4.						
5.					Percent of dominant Species	
Total Cover: 0 Prevalence Index worksheet: Sapling/Shrub Stratum 50% of Total Cover: 0 20% of Total Cover: 0 1						
Total Cover: 0 Total % Cover of: Multiply by: Sapling/Shrub Stratum 50% of Total Cover: 0 20% of Total Cover: 0 Pace Stratum 1					Prevalence Index worksheet:	
1			Total Covor		Total % Cover of: Multiply by:	
2.	<u></u>				OBL Species40 x 1 =40	
3.					FACW Species 19 x 2 = 38	
4.					FAC Species <u>5.2</u> x 3 = <u>15.6</u>	
5.					FACU Species x 4 =	
6.	5				UPL Species x 5 =	
0.					Column Totals: 64.2 (A) 93.6 (B)	
8.	_	-				
9.						
10. Total Cover: 0 Herb Stratum 50% of Total Cover: 0 20% of Total Cover: 0 1. Carex aquatilis 25 ✓ OBL Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 1. Carex aquatilis 25 ✓ OBL Problematic Hydrophytic Vegetation ¹ (Explain) 2. Eriophorum angustifolium 15 ✓ OBL Problematic Hydrophytic Vegetation ¹ (Explain) 3. Petasites frigidus 10 FACW FACW Plot size (radius, or length x width) vegetation. 1 5. Saxifraga nelsoniana 3 FAC Plot size (radius, or length x width) r=15m % 6. Poa arctica 2 FAC Plot size (radius, or length x width) r=15m % 7. Saxifraga cernua 2 FAC % % % % 8. Alopecurus magellanicus 2.1 FAC %					Hydrophytic Vegetation Indicators:	
Total Cover: 0 50% of Total Cover: 0 20% of Total Cover: 0 1. Carex aquatilis 25 ✓ OBL Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 2. Eriophorum angustifolium 15 ✓ OBL Problematic Hydrophytic Vegetation ¹ (Explain) 3. Petasites frigidus 10 FACW FACW Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 4. Dupontia fischeri 5 FACW FACW Plot size (radius, or length x width) r=15m 5. Saxifraga nelsoniana 2 FAC Vere applicable) % Cover of Wetland Bryophytes 7. Saxifraga cernua 2 FACW % Bare Ground 5 5 9. Cochlearia officinalis 0.1 FAC % Bare Ground 5 7 10. Rumex arcticus 0.1 FAC FAC Yerewalence Index is ≤ 3.0 1 1 10. Rumex arcticus 0.1 FAC FAC Yerewalence Index is ≤ 3.0 1 1 10. Rumex arcticus 0.1 FAC FAC Yerewalence Index is ≤ 3.0 1 1	B					
Herb Stratum 50% of Total Cover: 0 20% of Total Cover: 0 Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 1. Carex aquatilis 25 ✓ OBL □ Problematic Hydrophytic Vegetation ¹ (Explain) 2. Eriophorum angustifolium 15 ✓ OBL □ Problematic Hydrophytic Vegetation ¹ (Explain) 3. Petasites frigidus 10 □ FACW □ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 4. Dupontia fischeri 5 □ FACW Plot size (radius, or length x width) r=15m 5. Saxifraga cernua 2 □ FAC % Cover of Wetland Bryophytes [Where applicable] 9. Cochlearia officinalis 0.1 □ FAC % Bare Ground 5 [Total Cover: 64.2 Hydrophytic Yegetation		er: 0			✓ Prevalence Index is ≤3.0	
2. Eriophorum angustifolium 15 Image: Second	Herb Stratum 50% of Total Cover:		_		Remarks or on a separate sheet)	
3. Petasites frigidus 10 FACW be present, unless disturbed or problematic. 4. Dupontia fischeri 5 FACW be present, unless disturbed or problematic. 5. Saxifraga nelsoniana 3 FAC Plot size (radius, or length x width) r=15m 6. Poa arctica 2 FAC Wetland Bryophytes (Where applicable) Wetland Bryophytes 7. Saxifraga cernua 2 FACW FACW % Bare Ground 5 5 8. Alopecurus magellanicus 2 FACW % Bare Ground 5 5 5 9. Cochlearia officinalis 0.1 FAC FAC Yegetation 90 5 10. Rumex arcticus 0.1 FAC FAC Yegetation 90 10	· · · · · · · · · · · · · · · · · · ·					
3. Feasilies inglues 10 FACW 4. Dupontia fischeri 5 FACW 5. Saxifraga nelsoniana 3 FAC 6. Poa arctica 2 FAC 7. Saxifraga cernua 2 FACW 8. Alopecurus magellanicus 2 FACW 9. Cochlearia officinalis 0.1 FAC 10. Rumex arcticus 0.1 FAC Total Cover: 64.2					¹ Indicators of hydric soil and wetland hydrology must	
5. Saxifraga nelsoniana 3 FAC Plot size (radius, or length x width) r=15m 6. Poa arctica 2 FAC % Cover of Wetland Bryophytes (Where applicable) 7. Saxifraga cernua 2 FACW % Bare Ground 5 8. Alopecurus magellanicus 2 FACW % Bare Ground 5 9. Cochlearia officinalis 0.1 FAC Total Cover: 64.2 10. Rumex arcticus 0.1 FAC Hydrophytic Vegetation Plot size (radius, or length x width) r=15m 9. Cochlearia officinalis 0.1 FAC % Bare Ground 5 10. Rumex arcticus 0.1 FAC FAC Vegetation Descented area officinalis						
6. Poa arctica 2 FAC FAC % Cover of Wetland Bryophytes 7. Saxifraga cernua 2 FACW % Cover of Wetland Bryophytes 8. Alopecurus magellanicus 2 FACW % Bare Ground 5 9. Cochlearia officinalis 0.1 FAC Total Cover: 64.2 10. Rumex arcticus 0.1 FAC Hydrophytic 90 Hydrophytic Vegetation Data Pace No	E Sovifrago polooniano					
7. Saxifraga cernua 2 FACW FACW (Where applicable) 8. Alopecurus magellanicus 2 FACW % Bare Ground 5 9. Cochlearia officinalis 0.1 FAC Total Cover of Bryophytes 90 10. Rumex arcticus 0.1 FAC FAC Hydrophytic Vegetation Description of the second of the		2				
8. Alopecurus magellanicus 2 FACW % Bare Ground 5 9. Cochlearia officinalis 0.1 FAC Total Cover of Bryophytes 90 10. Rumex arcticus 0.1 FAC FAC Hydrophytic Vegetation	z Sovifraga comus	2				
9. Cochlearia officinalis 0.1 FAC Total Cover of Bryophytes 90 10. Rumex arcticus 0.1 FAC FAC Hydrophytic Vegetation Drotal Cover: 64.2	9 Alonocurus magallanicus	2				
10. Rumex arcticus 10. Total Cover: 64.2 FAC Hydrophytic Vegetation Drocent2 Yes						
Total Cover: Vegetation						
					Vegetation	
			otal Cover	: 12.84		

WETLAND DETERMINATION DATA FORM - Alaska Region

Remarks: trace stelaria longipes, saxifraga hieraciifolia. Low confidence in Saxnel ID--saxifrage, leaves and distribution match Hulten.

(inches) Color (moi	latrix		Red	ox Featı	ires		_		
	st)	%	Color (moist)	%	Type ¹	<u>Loc</u> ²	Textu	ire	Remarks
0-4		100					Hemic Organic	s	
4-8 10YR	3/3	100					Silty Clay Loan	1	
ype: C=Concentration. D=	Depletion. R	M=Reduced					annel. M=Matri	ĸ	
ydric Soil Indicators:			Indicators for P			Soils' :	_		
Histosol or Histel (A1) Histic Epipedon (A2)			Alaska Color C		-		Alaska Gle		Hue 5Y or Redder
Hydrogen Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		✓ Other (Exp	olain in Rem	arks)
Thick Dark Surface (A12 Alaska Gleyed (A13))		³ One indicator of and an appropria	f hydroph	ytic vegetati	ion, one pi	rimary indicator	of wetland	hydrology,
Alaska Redox (A14)					ape position	must be t	bresent.		
Alaska Gleyed Pores (A1	5)		⁴ Give details of o	color chan	ige in Remai	rks.			
strictive Layer (if present):									
Type: seasonal frost							Hydric So	il Present	t? Yes 🖲 No 🔾
Depth (inches): 8									
(2201.00)/									
	ators:						Sec	ondary Ind	ficators (2 or more required)
etland Hydrology Indica		ient)					Sec		dicators (2 or more required) ned Leaves (B9)
etland Hydrology Indica		ient)	Inundation \	/isible on	Aerial Imag	ery (B7)	<u></u>	Water Stair	
tland Hydrology Indicationary Indicators (any o Surface Water (A1)		ient)	Inundation Sparsely Vec		-	, , ,		Water Stair Drainage Pa	ned Leaves (B9) atterns (B10)
imary Indicators (any o Surface Water (A1) High Water Table (A2)		ient)	Sparsely Veg	getated Co	-	, , ,		Water Stair Drainage Pa Oxidized Rh	ned Leaves (B9) atterns (B10)
etland Hydrology Indica imary Indicators (any o Surface Water (A1) High Water Table (A2) Saturation (A3)		ient)	Sparsely Veg	getated Co is (B15)	oncave Surfa	, , ,		Water Stair Drainage Pa Oxidized Rh Presence of	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4)
tland Hydrology Indica mary Indicators (any o Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	ne is suffic	cient)	Sparsely Veg Marl Deposit Hydrogen Su	getated Co s (B15) ulfide Odo	oncave Surfa or (C1)	, , ,		Water Stair Drainage Pa Oxidized Rh Presence of Salt Deposi	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4)
Itland Hydrology Indication imary Indicators (any or stress of the st	ne is suffic	ient)	Sparsely Veg	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage Pa Oxidized Rh Presence of Salt Deposi Stunted or	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5)
etland Hydrology Indications (any of a surface Water (A1) Surface Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3)	ne is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage Po Oxidized Rh Presence of Salt Deposi Stunted or Geomorphi	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2)
etland Hydrology Indica imary Indicators (any o Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ne is suffic	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage P Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2)
etland Hydrology Indica imary Indicators (any o Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4)	n <u>e is suffic</u>	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage P Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
etland Hydrology Indica imary Indicators (any o 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)	n <u>e is suffic</u>	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage P Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
etland Hydrology Indications imary Indicators (any or 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)	n <u>e is suffic</u>	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season Other (Expla	getated Co s (B15) ulfide Odo Water Tal in in Rem	oncave Surfa or (C1) ble (C2)	, , ,		Water Stair Drainage P Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
etland Hydrology Indica imary Indicators (any o 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) Eld Observations: rface Water Present? ater Table Present?	ne is suffic		Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	yetated Co rs (B15) Ilfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2)	B8)		Water Stair Drainage P. Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog FAC-neutra	hed Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
etland Hydrology Indica rimary Indicators (any o 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) eld Observations: urface Water Present? ater Table Present? turation Present?	ne is suffic	No •	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season Other (Expla	yetated Co rs (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	B8)		Water Stair Drainage P. Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog FAC-neutra	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)
 High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) 	Yes ○ Yes ● Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season Other (Expla Depth (inc Depth (inc Depth (inc	yetated Co rs (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks) 3 1] Wet	land Hydrol	Water Stair Drainage P. Oxidized RH Presence of Salt Deposi Stunted or Geomorphi Shallow Aq Microtopog FAC-neutra	ned Leaves (B9) atterns (B10) nizospheres along Living Roots (C3 f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4) I Test (D5)

PEM1B Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Other: positive reaction to alpha, alpha-dipyridol. Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Presence of Reduced Iron (C4).



Project					- Alaska Region pe Borough Sampling Date: 30-Jul-15
Applica	Int/Owner: UIC				Sampling Point: BEO-23
••	gator(s): SLI, EKJ		Landform (hill	side. terrac	e, hummocks etc.): Flat
	elief (concave, convex, none): concave		Slope: 0.0		
	ion : Northern Alaska		71.283406666		Long.: -156.43366 Datum: WGS84
Soil Ma	p Unit Name:	_			NWI classification: PEM1S
	natic/hydrologic conditions on the site typical for this ti	me of vear	2 Yes	• No ()	(If no, explain in Remarks.)
Are V	egetation 🗌 , Soil 🗌 , or Hydrology 🔲 🤤	significantly	y disturbed?	Are "N	lormal Circumstances" present? Yes $ullet$ No $igodot$
Are V	egetation 🔲 , Soil 🗌 , or Hydrology 🗌	naturally pr	oblematic?	(If nee	eded, explain any answers in Remarks.)
SUMI	MARY OF FINDINGS - Attach site map show	wing sam	pling point	locations	s, transects, important features, etc.
Hy	drophytic Vegetation Present? Yes $ullet$ No $igodot$		le (ha Camr	
Hv	dric Soil Present? Yes ● No ○			-	oled Area etland? Yes O No〇
	etland Hydrology Present? Yes $oldsymbol{igstar}$ No $igstar$		WIT	hin a We	etiand? Yes I NOU
	arks: salt-affected high center polygons near coast. c tundra. TATION - Use scientific names of plants. Li				eider loafing in community. dunlin foraging. Salt killed
		Absolute	Dominant	Indicator	Dominance Test worksheet:
<u></u> 1.	ee Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
2.					Total Number of Dominant Species Across All Strata:7(B)
3. 4.					Percent of dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)
5.					
	Total Cover	:			Prevalence Index worksheet: Total % Cover of: Multiply by:
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20%	of Total Cover:	0	
1.	Salix rotundifolia	3	\checkmark	FAC	OBL Species 10.2 x 1 = 10.2 FACW Species 4 x 2 = 8
2.	Salix pulchra	2	\checkmark	FACW	FAC Species $55 \times 3 = 165$
3.		0			FACU Species $0 \times 4 = 0$
4.		0			
5.		_			UPL Species $10 \times 5 = 50$
6.		0			Column Totals: <u>79.2</u> (A) <u>233.2</u> (B)
7.		0			Prevalence Index = B/A = 2.944
8.		0			
9.	-	0			Hydrophytic Vegetation Indicators:
		0			✓ Dominance Test is > 50%
	Total Cover	: 5			✓ Prevalence Index is ≤3.0
Н	erb Stratum50% of Total Cover:	2.5 20%	of Total Cover:	1	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1.	Cochlearia officinalis	15	\checkmark	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
2.	Potentilla nana	15	\checkmark	FAC	¹ Indicators of hydric soil and wetland hydrology must
3.	Eriophorum angustifolium	10	\checkmark	OBL	be present, unless disturbed or problematic.
J.	-	10	\checkmark	FAC	
3. 4.	Luzula confusa			UPL	
	Luzula confusa Festuca brachyphylla	10	\checkmark	UFL	Plot size (radius, or length x width) $r=$
4.		10 7		FAC	Plot size (radius, or length x width) <u>r=</u> % Cover of Wetland Bryophytes
4. 5.	Festuca brachyphylla	·			Plot size (radius, or length x width) _r= % Cover of Wetland Bryophytes (Where applicable)
4. 5. 6.	Festuca brachyphylla Luzula nivalis	7		FAC	% Cover of Wetland Bryophytes
4. 5. 6. 7.	Festuca brachyphylla Luzula nivalis Poa arctica	7 5		FAC FAC	% Cover of Wetland Bryophytes
4. 5. 6. 7. 8.	Festuca brachyphylla Luzula nivalis Poa arctica Petasites frigidus	7 5 2		FAC FAC FACW	% Cover of Wetland Bryophytes (Where applicable) % Bare Ground
4. 5. 6. 7. 8. 9.	Festuca brachyphylla Luzula nivalis Poa arctica Petasites frigidus Stellaria humifusa	7 5 2 0.1 0.1		FAC FAC FACW OBL	% Cover of Wetland Bryophytes (Where applicable) % Bare Ground 80 Total Cover of Bryophytes 5

Code (model) % Code (model) % Type1 Loc 2 Texture Remarks 0-10 100 100 100 Items Cogaries Items Cogaries Interest Cogaries Items Cogaries Items Cogaries Items Cogaries Type: C=Concentration. D=Depletion. RM=Reduced Matrix * Location: PL=Powe Lining. RC=Root Channel. M=Matrix Matrix S0 in Cohange (TAN) Items Cogaries Histo Exploration (A) Items Appen consist: (A) Underlyfolguad Coged Withwoot Hue SY or Reducer Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reducer Histo Exploration (A) Items Appen consist: (CA) Underlyfolguad Coged Withwoot Hue SY or Reduce	Depth	Ma			Red	ox Featu	ai 65			
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Saturation (A3) Marl Deposits (B15) Presence of Reduced Iron (C4) Water Marks (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1) Drift deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) ✓ Shallow Aquitard (D3) Iron Deposits (B5) Microtopographic Relief (D4) Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) eld Observations: Ifface Water Present? Yes rface Water Present? Yes No No Depth (inches): Wetland Hydrology Present? Yes Ves No Depth (inches): Wetland Hydrology Present? Yes No corded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: marks: Marks:	DROLC	Irology Indicato		ient)						
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Sediment Deposits (B2) □ Dry-Season Water Table (C2) □ Stunted or Stressed Plants (D1) □ Drift deposits (B3) □ Other (Explain in Remarks) □ Geomorphic Position (D2) □ Algal Mat or Crust (B4) □ Shallow Aquitard (D3) □ Iron Deposits (B5) □ Microtopographic Relief (D4) □ Surface Soil Cracks (B6) □ Depth (inches): eld Observations: □ rface Water Present? Yes No □ Depth (inches): □ utration Present? Yes No □ Depth (inches): □ utration Present? Yes No □ Depth (inches): □ corded Data (stream gauge, monitor well, aerial photo, previous inspection), if available:	DROLO etland Hyd imary Indi Surface V	Irology Indicato icators (any one Water (A1)		ient)	_		-		Water Sta	ned Leaves (B9) Patterns (B10)
Drift deposits (B3) ○ Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) ✓ Shallow Aquitard (D3) Iron Deposits (B5) Microtopographic Relief (D4) Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) eld Observations: rface Water Present? Yes No No Depth (inches): wtaration Present? Yes No Depth (inches): cludes capillary fringe) Yes No Depth (inches): crorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: marks:	DROLO etland Hyd imarv Indi Surface V High Wat	Irology Indicato icators (any one Water (A1) ter Table (A2)		ient)	Sparsely Veg	getated Co	-		Water Sta	ined Leaves (B9) Patterns (B10) Ihizospheres along Living Roots (C3)
Algal Mat or Crust (B4) ✓ Shallow Aquitard (D3) Iron Deposits (B5) Microtopographic Relief (D4) Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) eld Observations: rface Water Present? Yes No<	DROLO etland Hyd imary Ind Surface V High Wat Saturatio	Irology Indicato icators (any one Water (A1) ter Table (A2) on (A3)		ient)	Sparsely Veg	getated Co s (B15)	oncave Surfa		Water Sta	ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4)
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Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) eld Observations: Inface Water Present? Yes No Depth (inches): Inface Water Present? Yes No Inface Water Present? Yes No No Inface Water Present? Yes No Inface Water Present Present? Yes <td< td=""><td>DROLO etland Hyd imary Indi Surface V High Wat Saturatio Water Ma Sedimen Drift dep</td><td>Irology Indicator icators (any one Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3)</td><td></td><td>ient)</td><td>Sparsely Veg Marl Deposit Hydrogen St Dry-Season</td><td>getated Co is (B15) ulfide Odo Water Tal</td><td>oncave Surfa or (C1) ble (C2)</td><td></td><td>Water Sta Drainage Oxidized F Presence Salt Depo Stunted o Geomorph</td><td>ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) • Stressed Plants (D1) ic Position (D2)</td></td<>	DROLO etland Hyd imary Indi Surface V High Wat Saturatio Water Ma Sedimen Drift dep	Irology Indicator icators (any one Water (A1) ter Table (A2) on (A3) arks (B1) t Deposits (B2) osits (B3)		ient)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Co is (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F Presence Salt Depo Stunted o Geomorph	ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) • Stressed Plants (D1) ic Position (D2)
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		Irology Indicator icators (any one Water (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: r Present? esent?	e is suffic	No 🖲 No 🕥	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	yetated Co rs (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F Presence G Salt Depor Stunted of Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) • Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
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sseasonal frost	YDROLC /etland Hyd 'rimary Indi Surface V High Wat Saturatio Water Ma Sedimen Drift dep Algal Mat Iron Dep Surface Saturation Pre includes capil	Irology Indicato icators (any one Nater (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) Tations: r Present? evesent? llary fringe)	Yes Yes Yes Yes Yes	No No No	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	yetated Co rs (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	 Wet l	Water Sta Drainage Oxidized F Presence G Salt Depor Stunted of Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) • Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
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	YDROLC Vetland Hyd Primary Indi Surface V High Wal Saturatio Water Ma Sediment Drift dep Algal Mat Iron Dep Surface S Vater Table P aturation Pre includes capil ecorded Da	Irology Indicato icators (any one Water (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) rations: r Present? resent? resent? llary fringe) ta (stream gaue	Yes Yes Yes Yes Yes	No No No	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	yetated Co rs (B15) ulfide Odo Water Tal in in Rem hes):	oncave Surfa or (C1) ble (C2) harks)	 Wet l	Water Sta Drainage Oxidized F Presence G Salt Depor Stunted of Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) thizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) • Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
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PEM1S Wetland Functional Class: Saturated Salt-killed Meadow Wildlife Habitat: Salt-killed Tundra



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Shallow Aquitard (D3), FAC-neutral Test (D5).



Project/Site: Barrow Environmental Obseratory		TION DA		- Alaska Region pe Borough Sampling Da	ate: 30-Jul-15
Applicant/Owner: UIC				Sampling Point:	
Investigator(s): SLI, EKJ	I :	andform (hil	lside terrac	e, hummocks etc.): Flat	BE0-24
Local relief (concave, convex, none): concave		Slope: 0.0		-	
		•			Datum: WGS84
Subregion : Northern Alaska	Lat.: 71	1.27661		Long.: -156.43133	-
Soil Map Unit Name:				NWI classification: PE	M1B
Are climatic/hydrologic conditions on the site typical for this ti	2		• No O	(If no, explain in Remarks.)	Yes 🔍 No 🔾
	significantly o				
Are Vegetation 🗋 , Soil 🗋 , or Hydrology 🗋	naturally prot	blematic?	(If nee	eded, explain any answers in Remain	rks.)
SUMMARY OF FINDINGS - Attach site map sho	wing samp	oling point	locations	s, transects, important featur	es, etc.
Hydrophytic Vegetation Present? Yes $ullet$ No $igodot$		le	the Sami	oled Area	
Hydric Soil Present? Yes 🖲 No 🔾			thin a We		
Wetland Hydrology Present? Yes 🔍 No 🔾		VVI			
Remarks: low center polygonal tundra rim. common goos	e and caribou	u scat.			
VEGETATION - Use scientific names of plants. L	ist all spec	ies in the	plot.		
	Absolute	Dominant	•	Dominance Test worksheet:	
Tree Stratum	% Cover	Species?	Status	Number of Dominant Species	
1				That are OBL, FACW, or FAC:	4 (A)
2.				Total Number of Dominant Species Across All Strata:	4 (B)
3.				Percent of dominant Species	(B)
4.				That Are OBL, FACW, or FAC:	(A/B)
5				Prevalence Index worksheet:	
Total Cover					tiply by:
Sapling/Shrub Stratum 50% of Total Cover:	<u>0</u> 20% of	f Total Cover	:	OBL Species 25 x 1	
1. Salix rotundifolia	3	✓	FAC	FACW Species 15 x 2	25
2. Salix ovalifolia	2	✓	FAC	FAC Species 15.1 x 3	
3	0			FACU Species 0 x 4	
4				UPL Species 0 x 5	
5				Column Totals: 55.1 (A)	
6.	-			Column Totals: <u>55.1</u> (A)	
7.	0			Prevalence Index = B/A =	1.820
8.				Hydrophytic Vegetation Indicator	'S:
9				Dominance Test is > 50%	
10	0			✓ Prevalence Index is ≤ 3.0	
		f Total Cause		Morphological Adaptations ¹ (Pro	
Herb Stratum 50% of Total Cover:	2.5 20% 0		: _1	Remarks or on a separate sheet	
1. Carex aquatilis	20	\checkmark	OBL	Problematic Hydrophytic Vegetat	
2. Eriophorum russeolum	15		FACW	¹ Indicators of hydric soil and wetland	hydrology must
3. Eriophorum angustifolium	5		OBL	be present, unless disturbed or proble	ematic.
4. Poa arctica	5		FAC		
5. Luzula nivalis	5		FAC	Plot size (radius, or length x width)	<u>r=5m</u>
6. Stellaria longipes	0.1		FAC	% Cover of Wetland Bryophytes	
7	0			(Where applicable) % Bare Ground	20
8				% Bare Ground Total Cover of Bryophytes	30
9	0	1 1		I Utal Cover of pryophytes	65

10.02

0

50.1

50% of Total Cover: <u>25.05</u> 20% of Total Cover:

Total Cover:

Hydrophytic Vegetation Present?

Yes

No O

Remarks:	trace	роа	sp
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10.

Profile Description: (Describe to the second	latrix				ox Featı	ures		_	
(inches) Color (moi	st)	%	Color (m	oist)	%	Type 1	Loc ²	Texture	Remarks
0-4		100						Hemic Organics	
4-6 10YR	4/2	50	10YR	3/3	50		М	Silt Loam	
6-8		100						Hemic Organics	
									I
									·
								·	
Type: C=Concentration. D=	Depletion. R	M=Reduce						annel. M=Matrix	
ydric Soil Indicators:			_			tic Hydric	Soils ³ :		
Histosol or Histel (A1)				ska Color Cl		-			out Hue 5Y or Redder
Histic Epipedon (A2)				ska Alpine s					
Hydrogen Sulfide (A4)				ska Redox V	Nith 2.5Y	Hue		Other (Explain in R	emarks)
Thick Dark Surface (A12	.)		3 One i	indicator of	hydroph	vtic vegetati	on one pr	imary indicator of wetla	nd hydrology
Alaska Gleyed (A13)						ape position			
 Alaska Redox (A14) Alaska Gleyed Pores (A1 	5)		4	dotaila -f	olor ol	ao in D	rka		
	5)		. Give	details of c	olor chan	ige in Remai	rks.		
estrictive Layer (if present):									
Type: seasonal frost								Hydric Soil Pres	ent? Yes $ullet$ No $igcap$
Type: Seasonal hose								-	
Denth (inches): 8									
Depth (inches): 8 emarks: ozen at 8in, assume orga	anics contir	nue to me	eet A2 red	quirement	S				
emarks: bozen at 8in, assume orga	anics contir	nue to me	eet A2 red	quirement	S				
YDROLOGY		nue to me	eet A2 red	quirement	S			Secondary	Indicators (2 or more required)
YDROLOGY Yetland Hydrology Indica	ators:		eet A2 rec	quirement	S				Indicators (2 or more required)
YDROLOGY /etland Hydrology Indica	ators:					Aerial Imag		Water S	tained Leaves (B9)
YDROLOGY Yetland Hydrology Indica Trimary Indicators (any o Surface Water (A1)	ators:			nundation V	'isible on	Aerial Imag		Water S	tained Leaves (B9) e Patterns (B10)
YDROLOGY Yetland Hydrology Indicators (any or compared to the second s	ators:		In Sp	nundation V parsely Veg	'isible on letated Co	Aerial Imago		Water S	tained Leaves (B9)
YDROLOGY Ydrand Hydrology Indicators (any organization of the second s	ators:		□ In □ Si □ M	nundation V parsely Veg arl Deposits	'isible on letated Co s (B15)	oncave Surfa		Water S Water S Drainag Oxidized Presence	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4)
YDROLOGY Ydrand Hydrology Indicators (any organization of the second s	ators: one is suffic		Ir Sp M H	nundation V parsely Veg Jarl Deposits ydrogen Su	lisible on letated Co s (B15) Ifide Odd	oncave Surfa or (C1)		Water S Drainag Oxidized Presenc Salt Dep	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4)
Primary Indicators (any o Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ators: one is suffic		Ir Sp M H' D	nundation V parsely Veg arl Deposits	'isible on letated Co s (B15) Ifide Odc Water Tal	oncave Surfa or (C1) ble (C2)		Water S Drainag Oxidized Presenc Salt Dep Stunted	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5)
Permarks: bozen at 8in, assume orga YDROLOGY Yetland Hydrology Indicators (any on surface Water (A1) Image: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	ators: one is suffic		Ir Sp M H' D	nundation V parsely Veg larl Deposit: ydrogen Su ry-Season V	'isible on letated Co s (B15) Ifide Odc Water Tal	oncave Surfa or (C1) ble (C2)		Water S Water S Drainag Oxidized Presenc Salt Dep Stunted Geomor	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1)
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PEM1B

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



WET Project/Site: Barrow Environmental Obseratory	AND DETERMINAT		I - Alaska Region ope Borough Sampling Date:	30-Jul-15
Applicant/Owner: UIC				BEO-25
Investigator(s): SLI, EKJ	Lar	ndform (hillside, terra	ace, hummocks etc.): Flat	
Local relief (concave, convex, none): concave	Slo	ope: 0.0 %/ 0	.0 ° Elevation: 25	
Subregion : Northern Alaska	Lat.: 71.	2766333333333	Long.: -156.431433333333 Date	um: WGS84
Soil Map Unit Name:			NWI classification: PEM1F	-
Are climatic/hydrologic conditions on the site typic	I for this time of vear?	Yes 🖲 No 🕻		
Are Vegetation , Soil , or Hydrolo	-	sturbed? Are '	Normal Circumstances" present? Yes) No ()
Are Vegetation , Soil , or Hydrolo	gy 🗌 naturally probl		eeded, explain any answers in Remarks.)	
SUMMARY OF FINDINGS - Attach site	han showing sampli	ing point location	os transects important features et	'n
Hydrophytic Vegetation Present? Yes •				.0.
Hydric Soil Present? Yes •			npled Area	
Wetland Hydrology Present? Yes •		within a W	/etland? Yes \odot No \bigcirc	
Remarks: low center polygonal tundra. polygor		is community are fai	rly wet given the dry season E seems the n	nost annronriate
hydro code.		is community are rul	The day season a seems the h	
EGETATION - Lies scientific names of	lanta List all spacis	a in the plat		
/EGETATION - Use scientific names of	·	•		
Tree Stratum		Dominant Indicato Species? Status	Dominance Test worksheet: Number of Dominant Species	
1.				<u>1</u> (A)
2.			Total Number of Dominant	
3.			·	<u>1</u> (B)
4.			Percent of dominant Species That Are OBL, FACW, or FAC: 100).0% (A/B)
5			Prevalence Index worksheet:	
	otal Cover:		Total % Cover of: Multiply by	<i>/</i> :
Sapling/Shrub Stratum 50% of Total	Cover: 20% of -	Total Cover:0	OBL Species 42 x 1 =	42
1			FACW Species 0 x 2 =	0
2 3.			FAC Species x 3 =	0
			FACU Species x 4 =	0
4 5			UPL Species x 5 =	0
6.			Column Totals: <u>42</u> (A)	42 (B)
7.			Prevalence Index = B/A = 1.	000
8.			Hydrophytic Vegetation Indicators:	
9			\checkmark Dominance Test is > 50%	
10			\mathbf{V} Prevalence Index is ≤ 3.0	
50% of Total	otal Cover: Cover:0 20% of ⁻	Total Cover: 0	Morphological Adaptations ¹ (Provide su	pporting data in
Herb Stratum		-	 Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹(E) 	volain)
1. Carex aquatilis	30			
2. Ranunculus pallasii 3. Arctophila fulva	5		¹ Indicators of hydric soil and wetland hydrolo be present, unless disturbed or problematic.	gy must
4			-	
5.	0		Plot size (radius, or length x width)	_r=10m
6.			% Cover of Wetland Bryophytes	_1=10111
			(Where applicable)	
1			% Bare Ground	95
7. 8.				
	0 		Total Cover of Bryophytes	3
8 9 10			Hydrophytic	
8 9 10				

(inches) Color (main) % Type Loc. ² Texture Remarks 3-3 100 Pitic Quarks Intern Digarks Intern Digarks Intern Digarks 3-4 100 Intern Digarks Intern Digarks Intern Digarks Intern Digarks 3-13 100 Intern Digarks Intern Digarks Intern Digarks Intern Digarks 3-13 100 Intern Digarks Intern Digarks Intern Digarks Intern Digarks 3-13 100 Intern Digarks Intern Digarks Intern Digarks Intern Digarks Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Prore Lining, RC-Root Channel, M-Matrix * Mydros Biger Intern Digarks Intern Digarks Middle Stripted In Chart Alaska Color Charge (TA4) ⁴ Intern Digarks Intern Digarks Instruct Reduced Matrix * Location: PL-Prore Lining, RC-Root Channel, M-Matrix * Mydros Digarks Intern Digarks Intern Digarks Instruct Reduced Matrix * Location: PL-Prore Lining, RC-Root Channel, M-Matrix * Locating * Location: PL-P	Depth Matrix		Red	ox Featı	ires			
3.4 100 Henk Doparks with moreal inclusors 9-13 100 Henk Doparks with moreal inclusors Type: C-Concentration, D-D-petetion, RM-Reduced Matrix * Location: PL-Pore Lining, RC-Root Ohannel, M-Matrix Type: C-Concentration, D-D-petetion, RM-Reduced Matrix * Location: PL-Pore Lining, RC-Root Ohannel, M-Matrix Hildsside Hilds (A1) Alaska Color Change (TA1) Alaska Gloyed Without Hue 5Y or Redder White Soli Tables and Solid Tables and Solid State (A1) Alaska Alore swales (TA2) Undertypic Logian in Remarks) Hokas Gloyeel (A12) Alaska Alore swales (TA2) Undertypic Logian in Remarks) Alaska Gloyeel CA13) * One indicator of hydropytic expetiation, one primary indicator of wetsmal hydrology, and an appropriate landscape position must be present. Alaska Gloyeel CA13) * One indicator of hydropytic expetiation, one primary indicators (2 or more required). Problematic May Alaska Gloyeel CA13 Alaska Gloyeel CA13) * One indicator of hydropytic expetiation, one primary indicators (2 or more required). Problematic May Alaska Gloyeel CA13 Alaska Gloyeel Artis (A1) * Inundation Visible on Actrial Imagery (07) Water Marks (R1) Whydropeen Stiffee Color (C1) Startano (A3) Mand boposte (81) Water Marks		%	Color (moist)	%	Type 1	Loc ²	Texture	Remarks
9-13 100 Iteric Organics with intercal inclusions Type: C=Concentration. D=Depletion. RM=Reduced Matrix ¹ Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soll Indicators: Indicators for Problematic Hydric Solls ² : Indicator of Problematic Hydric Solls ² : Indicator of reproblematic Hydric Solls ² : Indicator of Indicators: Indicators for Problematic Hydric Solls ² : Indicator of Indicators: Indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an approprise lawage position mate present. Alaska Rdok (H) Alaska Rdok With 2.5Y Hue Other (Explain in Remarks) Alaska Rdok (H) Alaska Rdok With 2.5Y Hue Other (Explain in Remarks) Alaska Rdok (H) Alaska Rdok With 2.5Y Hue Other (Explain in Remarks) Alaska Rdok (H) Alaska Rdok With 2.5Y Hue Other (Explain in Remarks) Experiment Nindicators (L1) and an approprise lawage position mater by present? No ○ Primary Indicators (Intro of the Indicators (L1) Indicators (2 or more required). Within Wydrology Indicators: Indicators (Si) No ○ @ Suntactor (A3) Hydrogen Sufficient) Indicators (2 or more required). @ Suntactor (A3) Hydrogen Sufficient) Indicators (2 or more required). @ Suntactor (A1) Indindator Visible on Aerial Imagery (if?) <td< th=""><th>0-3</th><th>100</th><th></th><th></th><th></th><th></th><th>Fibric Organics</th><th></th></td<>	0-3	100					Fibric Organics	
Type: C = Concentration, D=Depletion, RM=Reduced Matrix ************************************	3-9	100					Hemic Organics	
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PEM1F

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Surface Water (A1), High Water Table (A2), Saturation (A3), Iron Deposits (B5).



WETLAND DETE Project/Site: Barrow Environmental Obseratory		ATA FORM · ·: North Slop	
Applicant/Owner: UIC			Sampling Point: BEO-26
Investigator(s): SLI, EKJ	Landform (hillside. terrace	e, hummocks etc.): Drained Lake Basin
Local relief (concave, convex, none): none	`	.0 %/ 0.0	
Subregion : Northern Alaska	Lat.: 71.2770366	6666667	Long.: -156.44063 Datum: WGS84
Soil Map Unit Name:			NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this time	of year? Ye	es 💿 No 🔿	(If no, explain in Remarks.)
	nificantly disturbed?		formal Circumstances" present? Yes \bigcirc No \bigcirc
	urally problematic?		ded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showir			transacts important features, etc.
Hydrophytic Vegetation Present? Yes • No O			
	l	s the Samp	
	v	vithin a We	tland? Yes \bullet No \bigcirc
Wetland Hydrology Present? Yes • No Remarks: large drained lake basin. patchy community change	es undetectable in i	mageryerirus	carage arcful dominants with varving moss cover man
vEGETATION - Use scientific names of plants. List			, , , , , , , , , , , ,
		t Indicator	Dominance Test worksheet:
Tree Stratum	<u>Cover</u> Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
2			Total Number of Dominant
3			Species Across All Strata: 2 (B)
4.			Percent of dominant Species That Are OBL, FACW, or FAC: 100,0% (A/B)
5.			That Are OBL, FACW, or FAC: (A/B)
Total Cover:			Prevalence Index worksheet: Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover: 0	20% of Total Cov	er: <u>0</u>	
1			OBL Species <u>5</u> x 1 = <u>5</u> FACW Species 35 x 2 = 70
2.			FAC Species $0 \times 3 = 0$
3			FACU Species $0 \times 4 = 0$
4	<u> </u>		UPL Species $0 \times 5 = 0$
5.			Column Totals: <u>40</u> (A) <u>75</u> (B)
6.	H		
7 8			Prevalence Index = B/A = <u>1.875</u>
8 9			Hydrophytic Vegetation Indicators:
10.			Dominance Test is > 50%
Total Cover:	0		✓ Prevalence Index is ≤ 3.0
Herb Stratum 50% of Total Cover:0	20% of Total Cov	ver: 0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Dupontia fischeri	25	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Eriophorum russeolum	10	FACW	¹ Indicators of hydric soil and wetland hydrology must
3. Eriophorum scheuchzeri	5	OBL	be present, unless disturbed or problematic.
4	0		
5			Plot size (radius, or length x width)
6			% Cover of Wetland Bryophytes (Where applicable)
7			% Bare Ground
8			Total Cover of Bryophytes 99
9 10			Hydrophytic
Total Cover:	40		Vegetation
50% of Total Cover:20	20% of Total Cov	er: <u>8</u>	Present? Yes No
Remarks:			

Depth (inches) Matrix Redox Features 0:4 0:0 fract (moist) % Type 1 Lec 2 Texture Remarks 0:4 100 micro Organics micro Organics micro Organics micro Organics 6:8 107R 3/2 100 micro Organics micro Organics 9:12 100 micro Organics micro Organics micro Organics 12:14 107R 3/2 100 micro Organics micro Organics 12:14 107R 3/2 Indicators Indicators Organics micro Organics 12:14 107R Micro Organics Micro Organics Micro Organics Micro Organics
0-4 100 Pinc Organics 4-6 100 Henic Organics
6-8 10/R 3/2 100 Sit Loam 8-12 100 Herric Organics Interfectorganics 12-14 10/R 3/2 100 Sit Laam with organic inclusions ** 12-14 10/R 3/2 100 Sit Laam with organic inclusions ** Type: C=Concentration. D=Depletion. RM=Reduced Matrix * Location: PL=Pore Linling. RC=Root Channel. M=Matrix Hydric Soil Fill Histosof or Hitel (A1) Alaska Alpies worker (A51) Alaska Alpies worker (A51) Alaska Alpies worker (A51) Histo Epipedon (A2) Alaska Alpies worker (A12) Alaska Alpies worker (A13) * Alaska Alpies worker (A14) Alaska Gleyed Pores (A15) * Give details of color change in Remarks. Exerticive Layer (# present): Type: Secondary Indicators (2 or more required). Type: Social flost Layer (# present): Type: Social flost User Stained Laws (8) Depth (inches): 14 Exerticive Layer (# present): Water Stained Laws (9) Oralinge Patterns (810) Hitto: Experiment Alaska (Biely
8-12 100 Iterric Organics 12-14 101R 3/2 100 14Type: C-Concentration. D-Depletion. RM-Reduced Matrix ² Location: PL-Pore Lining. RC-Root Channel. M-Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Indicator Anage (Anage (Anag
12:14 10YR 3/2 100 Sitt Lown with organic inclusions *Type: C=Concentration. D=Depletion. RM=Reduced Matrix *Location: PL=Pore Lining. RC=Root Channel. M=Matrix * *Hydric Soil Indicators: Indicators for Problematic Hydric Soils*: Alaska Gleyed Without Hue SY or Redder Histosod or Histel (A1) Alaska Color Channel (TA4)* Alaska Color Channel, M=Matrix Hydrogen Sulfide (A4) Alaska Redox With 2.SY Hue Other (Explain in Remarks) Thick Dark Surface (A12) Alaska Redox With 2.SY Hue Other (Explain in Remarks) Alaska Redox (A14) Alaska Redox With 2.SY Hue Other (Explain in Remarks) Alaska Redox (A15) * Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Hydric Soil Present? Yes No Depth (Inches): 14 Innundation Visible on Aerial Imagery (87) Drainage Patterns (B10) Surface Water (A1) Innundation Visible on Aerial Imagery (87) Drainage Patterns (B10) Yhigh Water Table (A2) Sparsely Vegetated Conceve Surface (88) Poreage Patterns (B10) Yhigh Water Table (A2) Dry-Sesson Water Table (22) Drainage Patterns (B10) Surface Water RB1) Sectiment Deposits (B3) Dry-Sesson Water Table (
¹ Type: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel, M=Matrix Hydric Soil Indicators: Tradicators for Problematic Hydric Soils ³ : Histic Epipedon (A2) Histic Epipedon (A2) Histic Epipedon (A2) Histic Coll and Aakak Apine swales (TA5) Underlying Layer Hydrigen Sufface (A1) Aakak Apine swales (TA5) Underlying Layer Hydrigen Sufface (A12) Aakak Clayer (A13) Aakak Redox Wht 2.5Y Hue Other (Explain in Remarks) Hydric Soil Present? Yes No Depth (inches): Id Hydrogen Sufface (A2) Hydrogen Sufface (A2) Hydrogen Sufface (A15) Hydrogen Sufface (A15) Hydric Soil Present? Yes No Depth (inches): Id Hydrogen Sufface (A13) Hydrogen Sufface (A14) Hydrogen Sufface (A15) Hydrogen Suffac
Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histicsol or Histel (11) Alaska Color Change (TA4) ⁴ Histic Epipedion (A2) Alaska Color Change (TA4) ⁴ Histic Epipedion (A2) Alaska Alpine swales (TA5) Histic Epipedion (A2) Alaska Alpine swales (TA5) Hydrogen Suffide (A4) Alaska Alpine swales (TA5) Alaska Celeyed (A13) Alaska Celeyed (A13) Alaska Geleyed (A13) an appropriate landscape position must be present. Alaska Celeyed (A14) Alaska Celeyed (A13) Alaska Geleyed Pores (A15) 4 Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Permark Si Wetland Hydrology Indicators: Inundation Visible on Aerial Imagery (87) Primark Indicators (A11) Inundation Visible on Aerial Imagery (87) Water Stained Leaves (89) Diving Roots (C3) Primark Indicators (A12) Sparsely Vegetated Concave Surface (88) Water Marks (B1) Hydrogen Suffice Odor (C1) Salt Deposits (C3) Water Marks (B1) Hydrogen Suffice Odor (C1) Salt Deposits (C3) Water Marks (B1) Hydrogen Suffice Odor (C1) Salt Deposits (C3)
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Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histicsol or Histel (11) Alaska Color Change (TA4) ⁴ Alaska Gleyed Without Hue SY or Redder Histic Epipedion (A2) Alaska Alpine swales (TA5) Underlying Layer Hydrogen Suffide (A4) Alaska Alpine swales (TA5) Underlying Layer Hydrogen Suffide (A1) Alaska Alpine swales (TA5) Underlying Layer Alaska Coley Change (TA4) ⁴ Alaska Alpine swales (TA5) Other (Explain in Remarks) Alaska Coley Change (TA4) ⁴ Alaska Alexow (X14) Interval Alaska Coley Change (TA4) ⁴ Alaska Coley Change (TA15) ⁴ Give details of color change in Remarks. Restrictive Layer (If present): Type: seasonal frost Present? Depth (inches): 14 Remarks: Hydric Soil Present? Yes (P) Primary Indicators (any one is sufficient) Inundation Visible on Aerial Imagery (87) Drainage Patterns (810) High Water Table (A2) Sparsely Vegetated Concave Surface (88) Dokized Rhizospheres along Living Roots (C3) Water Marks (B1) Hydrogen Suffide Odor (C1) Salt Deposits (C5) Dokized Rhizospheres Along Living Roots (C3) Water Marks (B1) Hydrogen Suffide Odor (C1) Salt Deposits (C5) Salt Deposits (C5) <
I Histosol or Histel (A1) Alaska Color Change (TA4) ⁴ Alaska Gieyed Without Hue SY or Redder Underlying Layer I Histic Epipedon (A2) Alaska Apine swales (TA5) Underlying Layer I Hydrogen Sulfide (A4) Alaska Apine swales (TA5) Underlying Layer I Hydrogen Sulfide (A4) Alaska Color Change (TA4) ⁴ Underlying Layer I Hydrogen Sulfide (A4) Alaska Color Change (TA4) ⁴ Underlying Layer I Hydrogen Sulfide (A1) I Alaska Color Change (TA4) ⁴ I CA4 I Hydrogen Sulfide (A1) I Cae indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Redox (A14) I Alaska Redox (A14) I Cae indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Hydric Soil Present? Yes No Restrictive Layer (If present): Type: seasonal frost Hydric Soil Present? Yes No No Primary Indicators (any one is sufficient) I nundation Visible on Aerial Imagery (B7) D rainage Patterns (B10) Presence of Reduced Iron (C4) Y Bativa Cuat (A1) I nundation Visible on Aerial Imagery (B7) D rainage Patterns (B10) Presence of Reduced Iron (C4) Yet Saturation (A3) Hydrogen Sulfide Odor (C1) Saturate Old Deposits (B5
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☐ Thick Dark Surface (12) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. ☐ Alaska Gleyed (A13) ^a Give details of color change in Remarks. Restrictive Layer (if present): ^x Give details of color change in Remarks. Peth (inches): 14 ^h Give details of color change in Remarks. Remarks: ^h Give details of color change in Remarks. Pt/DROLOGY ^h Give details of color change in Remarks. Wetland Hydrology Indicators: ^h Hydric Soil Present? Yes Primary Indicators (any one is sufficient) ^h Inundation Visible on Aerial Imagery (B7) Surface Water (A1) ^h Inundation Visible on Aerial Imagery (B7) Ø Halp Water Table (A2) ^b Sparsely Vegetated Concave Surface (B8) Ø Water Marks (B1) ^h Hydrogen Sulfide Odor (C1) Ø Geiment Deposits (B2) ^h Or Season Water Table (C2) Ø Drift deposits (B3) ^h Or Season Water Table (C2) Ø Algal Mat or Crust (B4) ^h Or Season Water Table (C2) Ø Shallow Aquitard (D3) ^h Hier Meretare Sile (D4) Ø Surface Soil Cracks (B6) ^k FAC-neutral Test (D5) <
Alaska Gleyed (A13) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Remarks: Type: seasonal frost Depth (inches): 14 Remarks: Primary Indicators (any one is sufficient)
Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Hydric Soil Present? Yes ● No ● Wetland Hydrology Indicators: Hydrology Indicators: Primary Indicators (2 or more required). Water Stained Leaves (B9) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Water Stained Leaves (B9) Oxidized Rhizospheres along Living Roots (C3) Y High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Saturation (A3) Marl Deposits (B15) Presence of Reduced Iron (C4) Saturation (A3) Orty-Season Water Table (C2) Stute of Stressed Plants (D1) Drift deposits (B3) Other (Explain in Remarks) Geomorphic Positin (D2) Alagal Mat or Crust (B4) Other (Explain in Remarks) Shallow Aquitard (D3) Surface Water Present? Yes No ● Depth (inches):
Restrictive Layer (if present): Type: seasonal frost Depth (inches): 14 Hydric Soil Present? Yes ● No ○ HyDROLOGY Image: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Image: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Image: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Image: Secondary Indicators (2 or more required) Image: Secondary Indicators (A) Marl Deposits (B15) Image: Secondary Indicators (A) Marl Deposits (B15) Image: Secondary Indicators (C3) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Marl Deposits (B15) Image: Secondary Indicators (C4) Saturation (C4) Saturation (A3) Image: Table (C2) Setiment Deposits (B2) Dry-Season Water Table (C2) In the Deposits (B3) Other (Explain in Remarks) In the Deposits (B5) Image: Secondary Ender (C4) Surface Soil Cracks (B6) Image: Secondary Indicators (C5) Field Observations: Depth (inches): Surface Water Present? Yes No ● Depth (inches):
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Type: seasonal frost Hydric Soil Present? Yes No Depth (inches): 14 Implication Im
Apple (inches): 14 Remarks: APDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one is sufficient) Image: Surface Water (A1) Image: Surface Water Present? Yes No Image: Depth (inches): Image: Surface Water Present? Yes No Image: Depth (inches):
AYDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one is sufficient) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Surface Water (A1) Water Table (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Staturation (D3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Field Observations: Surface Water Present? Yes No Depth (inches):
HYDROLOGY Wetland Hydrology Indicators:
Wetland Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one is sufficient) Water Stained Leaves (B9) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Image: Primary Indicators (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Image: Presence of Reduced Iron (C4) Marl Deposits (B15) Presence of Reduced Iron (C4) Image: Patterns (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1) Image: Drift deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) Image: Patterns (D5) Microtopographic Relief (D4) Surface Soil Cracks (B6) No O Depth (inches): Pethod (D5)
Primary Indicators (any one is sufficient) Water Stained Leaves (B9) Surface Water (A1) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Saturation (A3) Marl Deposits (B15) Presence of Reduced Iron (C4) Water Marks (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1) Drift deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) Microtopographic Relief (D4) FAC-neutral Test (D5) Surface Soil Cracks (B6) Depth (inches): Depth (inches): Depth (inches):
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Water Marks (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1) Drift deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) ✓ Shallow Aquitard (D3) Iron Deposits (B5) Microtopographic Relief (D4) Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5)
□ Sediment Deposits (B2) □ Dry-Season Water Table (C2) □ Stunted or Stressed Plants (D1) □ Drift deposits (B3) □ Other (Explain in Remarks) □ Geomorphic Position (D2) □ Algal Mat or Crust (B4) ☑ Shallow Aquitard (D3) □ Iron Deposits (B5) □ Microtopographic Relief (D4) ☑ Surface Soil Cracks (B6) ☑ FAC-neutral Test (D5) Field Observations: □ Depth (inches): Surface Water Present? Yes No
□ Drift deposits (B3) □ Other (Explain in Remarks) □ Geomorphic Position (D2) □ Algal Mat or Crust (B4) ☑ Shallow Aquitard (D3) □ Iron Deposits (B5) □ Microtopographic Relief (D4) □ Surface Soil Cracks (B6) ☑ FAC-neutral Test (D5) Field Observations: □ Depth (inches): Surface Water Present? Yes No
□ Iron Deposits (B5) □ Microtopographic Relief (D4) □ Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): □
□ Surface Soil Cracks (B6) ✓ FAC-neutral Test (D5) Field Observations: Surface Water Present? Yes No ● Depth (inches):
Field Observations: Yes No Depth (inches): Surface Water Present? Yes O Depth (inches):
Surface Water Present? Yes No Depth (inches):
Water Table Present? Yes No Depth (inches): 1 Wetland Hydrology Present? Yes No O
Saturation Present? Yes Ves No Depth (inches): 0
Recorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available:
Remarks:
D3seasonal frost
20.700/05
ec 2600uS temp 42

PEM1F Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



Project/Site: Barrow Environmental Obseratory	ETERMINATION DA Borough/City:		-
Applicant/Owner: UIC			Sampling Point: BEO-27
Investigator(s): SLI, EKJ	Landform (h	illside, terrac	e, hummocks etc.): Flat
Local relief (concave, convex, none): concave	Slope: 0.	0 % / 0.0	elevation: 25
Subregion : Northern Alaska	Lat.: 71.2765233	333333	 Long.: -156.440778333333 Datum: WGS84
Soil Map Unit Name:			NWI classification: PEM2H
Are climatic/hydrologic conditions on the site typical for this t	ime of year? Yes	s 💿 No 🔿	(If no, explain in Remarks.)
	significantly disturbed?	Are "N	ormal Circumstances" present? Yes No
Are Vegetation 🗌 , Soil 🗹 , or Hydrology 🗌	naturally problematic?	(If nee	ded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling poin	t locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No			•
Hydric Soil Present? Yes		the Samp	
Wetland Hydrology Present? Yes No	w	ithin a We	etland? Yes \bullet No \bigcirc
Remarks: small arcful pond in drained lake basin.			
/EGETATION - Use scientific names of plants. L	ist all species in the	e plot	
		Indicator	Dominance Test worksheet:
Tree Stratum	<u>% Cover</u> Species?	Status	Number of Dominant Species
1	🗆		That are OBL, FACW, or FAC: (A)
2			Total Number of Dominant Species Across All Strata: 1 (B)
3	· 片		Percent of dominant Species
4 5	·		That Are OBL, FACW, or FAC: (A/B)
5 Total Cove	· · · · · · · · · · · · · · · · · ·	. <u> </u>	Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:		er: 0	Total % Cover of: Multiply by:
			OBL Species <u>35</u> x 1 = <u>35</u>
0	· 💾		FACW Species 0 x 2 = 0
0			FAC Species $0 \times 3 = 0$
3.			FAC Species 0 $x \ 3 =$ 0 FACU Species 0 $x \ 4 =$ 0
3.			FAC Species 0 $x \ 3 =$ 0 FACU Species 0 $x \ 4 =$ 0 UPL Species 0 $x \ 5 =$ 0
3. 4.			FAC Species 0 $x \ 3 =$ 0 FACU Species 0 $x \ 4 =$ 0
3. 4. 5.			FAC Species 0 $x \ 3 =$ 0 FACU Species 0 $x \ 4 =$ 0 UPL Species 0 $x \ 5 =$ 0
3. 4. 5. 6. 7. 8.			FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:35(A)35
3. 4. 5. 6. 7. 8. 9.			FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:35(A)35Prevalence Index = B/A =1.000
3. 4. 5. 6. 7. 8. 9. 10.			FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Prevalence Index = $B/A =$ 1.000Hydrophytic Vegetation Indicators:
3. 4. 5. 6. 7. 8. 9. 10. Total Cover			FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Prevalence Index = $B/A =$ 1.000Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50%
3. 4. 5. 6. 7. 8. 9. 10. Total Cover: 50% of Total Cover:		er: 0 OBL	FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Prevalence Index = $B/A = 1.000$ Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is <3.0
3. 4. 5. 6. 7. 8. 9. 10. Total Cover: 50% of Total Cover:	$ \begin{array}{c} $		FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Morphytic Vegetation Indicators:Image: Comparison of the system of the syst
3.	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	OBL	FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Prevalence Index = $B/A = 1.000$ Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explain)
3.	$ \begin{array}{c} $	OBL	FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:35(A)35Prevalence Index = B/A =1.000Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
3.	$ \begin{array}{c} $	OBL	FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 35 (A) 35 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \land Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \bigcirc Problematic Hydrophytic Vegetation ¹ (Explain) 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15m</u>
3.	$ \begin{array}{c} $	OBL	FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 35 (A) 35 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark 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. Plot size (radius, or length x width) _r=15m % Cover of Wetland Bryophytes
3.	$ \begin{array}{c} $	OBL	FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 35 (A) 35 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is <3.0
3.	$ \begin{array}{c} $	OBL	FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 35 (A) 35 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: Dominance Test is > 50% Prevalence Index is <3.0
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3.	$ \begin{array}{c} $	OBL	FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 35 (A) 35 (B) Prevalence Index = B/A = 1.000 Hydrophytic Vegetation Indicators: Dominance Test is > 50% Prevalence Index is <3.0

Profile Descriptio	M	atrix		Red	ox Feat	uies		_	
inches)	Color (mois	t)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
							p		
ype: C=Con	centration. D=D	epletion. R	M=Reduce	d Matrix ² Location	: PL=Por	re Lining. RC	C=Root Cha	annel. M=Matrix	
ydric Soil I	ndicators:			Indicators for P	roblema	atic Hydric	Soils ³ :		
Histosol o	r Histel (A1)			Alaska Color C				Alaska Gleyed Without	t Hue 5Y or Redder
Histic Epip	oedon (A2)			Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydrogen	Sulfide (A4)			Alaska Redox V	With 2.5Y	/ Hue		✓ Other (Explain in Rem	arks)
Thick Darl	k Surface (A12)			_					
Alaska Gle	eyed (A13)			³ One indicator of and an appropria				rimary indicator of wetland	hydrology,
Alaska Re	dox (A14)			ани ан арргорпа	te ianusc	αρε μοσιτιοπ	must be p		
Alaska Gle	eyed Pores (A15	i)		⁴ Give details of c	olor char	nge in Rema	rks.		
atviative Le	on (if ma)								
	er (if present):							Hydric Soil Presen	t? Yes 🖲 No 🔾
Туре:									
Depth (incl	nes):								
	ssume hydric s	soil							
undatedas	ssume hydric :	soil							
undatedas	ssume hydric s							Secondary In	dicators (2 or more required)
undatedas	GY rology Indica	tors:	ient)					_	dicators (2 or more required) red Leaves (89)
Indatedas	GY rology Indica	tors:	ient)		/icible on	Aerial Imag	erv (B7)	Water Stain	ned Leaves (B9)
Indatedas IDROLO Ietland Hyd Imary India Surface V	GY rology Indica cators (any or Vater (A1)	tors:	ient)	Inundation V Sparsely Vec		-	, , ,	Water Stain Drainage P	ned Leaves (B9) atterns (B10)
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Indatedas Indatedas Indated Ind	GY rology Indica cators (any or Vater (A1) er Table (A2) n (A3)	tors:	ient)	Sparsely Veg	getated C is (B15)	oncave Surf	, , ,	Water Stain Urainage P Oxidized R Presence o	ned Leaves (B9) atterns (B10) hizospheres along Living Roots (C3) f Reduced Iron (C4)
Indatedas Indatedas Indated Ind	GY rology Indica cators (any or Vater (A1) er Table (A2) n (A3) ırks (B1)	tors:	ient)	Sparsely Veg	jetated C s (B15) ilfide Odo	oncave Surf	, , ,	Water Stair Drainage P Oxidized R Presence o Salt Depos	ned Leaves (B9) atterns (B10) hizospheres along Living Roots (C3) f Reduced Iron (C4) its (C5)
Indatedas IDROLO Identification Individual Indi	GY rology Indica cators (any or Vater (A1) er Table (A2) n (A3) arks (B1) : Deposits (B2)	tors:	ient)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	getated C is (B15) Ilfide Odo Water Ta	oncave Surf or (C1) ble (C2)	, , ,	Water Stain Water Stain Drainage P Oxidized R Oxidized R Presence o Salt Depos Stunted or	ned Leaves (B9) atterns (B10) hizospheres along Living Roots (C3) f Reduced Iron (C4) its (C5) Stressed Plants (D1)
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Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Nonpatterned Wet Meadow



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1), FAC-neutral Test (D5).



PEM2H

	WETLAND DETERM	INATION DAT	'A FORM - Ala	iska Region		
Project/Site: Barrow Environmental	Obseratory	Borough/City:	North Slope Bo	rough	Sampling Date:	: 30-Jul-15
Applicant/Owner: UIC				Sampli	ng Point:	BEO-28
nvestigator(s): SLI, EKJ		Landform (hill	side, terrace, hur	nmocks etc.):	Shoreline	
Local relief (concave, convex, none):	concave	Slope: 0.0	%/°	Elevation: 25		
Subregion : Northern Alaska	Lat.	71.276628333		g.: -156.453245	5	Datum: WGS84
Soil Map Unit Name:				NWI class	ification: PEM	1B
	or Hydrology Signification Hydrology and the naturally	ntly disturbed? v problematic? ampling point Is t	(If needed, o	Area	' present? Ye vers in Remarks	,
Remarks: raised shoreline between polygonal troughs are per /EGETATION - Use scientific n	n1e and pem1f wet sedge tun	dra.		ommunity. comr	non goose and o	aribou scat.
Tree Stratum 1. 2.	Absolu <u>% Cov</u>		Status Num Tha	ninance Test wor nber of Dominant S t are OBL, FACW, al Number of Domi cies Across All Str	Species or FAC: nant	4 (A) 4 (B)
3.			_			<u> </u>

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3.			_				Species Across All Strata:	4	(B)
			_				Percent of dominant Species		
4.			_				That Are OBL, FACW, or FAC:	100.0%	(A/B)
5.			_				Prevalence Index worksheet:		
		Total Cove	_					ly by:	
Sap	ling/Shrub Stratum	50% of Total Cover:	0	_ 20% of Tot	al Cover:	0	OBL Species 15 x 1 =	15	
1.	Salix rotundifolia			10	\checkmark	FAC	FACW Species $22.2 \times 2 =$	44.40	
2.				0			FAC Species 27 x 3 =		
				0			FACU Species 0 x 4 =		
				0			UPL Species $0 \times 5 =$		
				0				0	
				0			Column Totals: <u>64.2</u> (A)	140.4	(B)
				0			Prevalence Index = B/A =	2.187	
				0					
				0			Hydrophytic Vegetation Indicators:		
				0			✓ Dominance Test is > 50%		
		Total Cove		10			✓ Prevalence Index is \leq 3.0		
н	erb Stratum	50% of Total Cover:	5	20% of Tot	al Cover:	2	Morphological Adaptations ¹ (Provi Remarks or on a separate sheet)	de supporting o	data in
1.	Eriophorum russeolum			15	\checkmark	FACW	Problematic Hydrophytic Vegetation	n ¹ (Explain)	
2.				10	\checkmark	OBL	¹ Indicators of hydric soil and wetland hy	drology must	
3	Detection frigidue			7		FACW	be present, unless disturbed or problem		
4.				5		FAC			
5.	D			5		FAC	Plot size (radius, or length x width)	r=5m	
6.				5		FAC	% Cover of Wetland Bryophytes	<u>_1_311</u>	
7.	Eriophorum angustifolium			5		OBL	(Where applicable)	-	
8.	Saxifraga nelsoniana			2		FAC	% Bare Ground	20	
9.	Covifrage correlia			0.1		FACW	Total Cover of Bryophytes	60	
10.	Saxifraga foliolosa		_	0.1		FACW	Hydrophytic		
	-	T 1 1 6		54.2			Vegetation		
10.		Total Cove		<u>54.2</u>					
10.		50% of Total Cover:	_		al Cover:	10.84	Present? Yes • No	\supset	

Depth Color (mesh) % Color (mesh) % Type: Texture Remarks 0-2 7.5 YR 3/2 98 5YR 2.5/2 2 C PL Silv Cay Land with thin minered and at in 7-10 100 100 Henic Copanic with thin minered and at in PH 7-10 100 100 Henic Copanic with thin minered and at in 7-10 100 100 Henic Copanic with thin minered and at in 7-10 100 100 Henic Copanic with thin minered and at in 7-10 100 100 Henic Copanic with thin minered and at in 7-10 100 100 Henic Copanic with thin minered and at in 7-10 100 Introduction Henic Copanic with thin minered and at in 7-10 Introduction Henic Copanic Henic Copanic Henic Copanic 7-10 Introduction Henic Copanic Henic Copanic Henic Copanic 7-10 Introduction Henic Copanic Henic Copanic Henic Copanic Fintroduction	(inches) Color (mois) 0-2	100 3/2 98						
2-7 7.5YR 3/2 98 5YR 2.5/2 2 C P. Sky Cky Leam 7-10 100 100 Ident: Organics with mineral inclusions Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Pore Lining. RC-Root Channel. M-Matrix Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Pore Lining. RC-Root Channel. M-Matrix Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Pore Lining. RC-Root Channel. M-Matrix Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Pore Lining. RC-Root Channel. M-Matrix Type: C-Concentration. D-Depletion. RM-Reduced Matrix * Location: PL-Pore Lining. RC-Root Channel. M-Matrix Type: Secondary Linite(A) Alasta Alpine swills: (TA) Undertyping Layer Hight Grading Matrix (A) Alasta Alpine swills: (TA) Matrix Location: Plotenatic typing Cole Alasta Gleyed Pores (A15) * One Indicator of hydrophydre vegetation, one primary indicator of wetman hydrology, and an appropriate landscape position must be present. Alasta Gleyed Pores (A15) * Give details of color change in Remarks. Strictive Layer (f) present? Yeg () No () Depth (inches): 10 Imman Locaticator for Profeomatic Hydrophydre vegetation, one primary indicators (2 or more reaulired	2-7 7.5YR 7-10	3/2 98	5YR	2.5/2 2	C	Loc 2	Texture	Remarks
7-10 100 Hemc Organics with mineral inclusions Type: C=Concentration. D=Depletion. RN=Reduced Matrix ² Location: PL=Pere Lining. RC=Root Channel. M=Matrix Tindicators for Problematic Hydric Soils ³ : Image: Calibratic Change (TA1) Image: Calibratic Change: Calibratic Change: Ca	7-10		5YR	2.5/2 2	C		Hemic Organics	with thin mineral band at 1in
Ype: C=Concentration. D=Depletion. RM=Reduced Matrix ¹ Location: PL=Pore Lining, RC=Root Channel, M=Matrix Yupe: C=Concentration. D=Depletion. RM=Reduced Matrix ¹ Location: PL=Pore Lining, RC=Root Channel, M=Matrix Yuper Soil Indicators: Indicators for Problematic Hydric Soils ² : Indicators for Problematic Hydric Soils ² : Indicators for Problematic Hydric Soils ² : Indicators: Indicators for Problematic Hydric Soils ² : Indicators: Indicator for Yupophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Asaka Gleyed (A13) ³ One indicator of Hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Asaka Gleyed Pores (A15) ⁴ Give details of color change in Remarks. strictive layer (f) present): Type: seasonal frost Depth (inches): 10 Inundation Visible on Aerial Imagery (f7) Surface Water (A1) Inundation Visible on Aerial Imagery (f7) Hydropens (G2) Oxider and Rinscapenera along Lining Roots (C2) Surface Water (A3) Genorphic Postion (C4) Surface Water (A1) Inundation Visible on Aerial Imagery (f7) Surface Water (A1) Genorphic Postion (C4) Surface Water (A3) Genorphic Postino (C4) Surface Water (A1)				·		PL	Silty Clay Loam	
ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Aaska Color Change (TA ⁴) Aaska Color Change in Remarks. * Give details of color change in Remarks. ** ** ** ** ** ** ** ** ** ** ** ** **							Hemic Organics	with mineral inclusions
ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Aaska Color Change (TA ⁴) Aaska								
ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Aaska Color Change (TA ⁴) Aaska Color Change in Remarks. * Give details of color change in Remarks. ** Stickbe Layer (if present): Type: seasonal frost Depth (Inches): 10 marks: ** Stirkbe Cayer (Ta) Aaska Color Change (TA) Aaska Color Change in Remarks. ** Stirkbe Cayer (Ta) Aaska Color Change in Remarks. ** Stirkbe Cayer (Ta) Aaska Color Change in Remarks. ** Stirkbe Cayer (Ta) Aaska Color Change in Remarks. ** Stirkbe Cayer (Ta) Aaska Color Change in Remarks. ** Stirkbe Cayer (Ta) Aaska Color Change in Remarks. ** Stande Cators: ** Table Color Change in Remarks. ** Stande Cators: ** Table Color Change in Remarks. ** Stande Cators:	vpe: C=Concentration D=I			·				
Histosol or Histel (A1) □ Alaska Color Change (TA4)* □ Alaska Appine swales (TA5) □ Underfying Layer Histic Epipedion (A2) □ Alaska Appine swales (TA5) □ Other (Explain in Remarks) Thick Dark Surface (A12) □ Alaska Appine swales (TA5) ○ Other (Explain in Remarks) Alaska Gleyed (A13) □ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. strictive Layer (if present): Type: seasonal frost Depth (inches): 10 □ marks: Sitive reaction to alpha, alpha-dipyridol //CROLOGY Fersent? Yes Saturation (A2) Surface Water (A1) □ Inundation Visible on Aerial Imagery (B7) Hydric Soil Present? Yes © No ○ Surface Water (A1) □ Inundation Visible on Aerial Imagery (B7) Water Marks (B1) □ Hydrogen Suffice Oracle (B8) Ø Saturation (A3) □ Mar Deposits (B15) Ø Saturation (A3) □ Other (Explain in Remarks) I Hydrogen Suffice Otary (C1) □ Saturation (C2) Saturation (A3) □ Other (Explain in Remarks) I Hydrogen Suffice Otaror (C		Depletion. RM=R					nnel. M=Matrix	
Histic Epipedon (A2) □ Alaska Alpine swales (TA5) Underlying Layer Hydrogen Suffide (A4) □ Alaska Redox With 2.5Y Hue ☑ Other (Explain in Remarks) Alaska Gleyed (A13) □ One inficiator of hydrophydic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed (A13) □ One inficiator of hydrophydic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ▲ Give details of color change in Remarks. estrictive Layer (if present): Type: seasonal frost Depth (inches): 10 □ startation to alpha, alpha-dipyridol YPROLOCY Veter Name (B1) □ Hydrogen Sufficent) □ Immary Indicators (2 or more required) I'mary Indicators (2 ny one is sufficient) □ I'mary Indicators (A13) □ Bistration (A3) □ I'mary Indicators (B15) □ Vater Marks (B1) □ I'mary Indicators (B2) □ Orsees (B2) □ Surface R(A3) □ Mark prosents (B2) □ I'mary Indicators (B1) □ <	-		_					
Important Sulfide (A4) Alaska Redox With 2.5Y Hue ☑ Other (Explain in Remarks) Imich Dark Sufface (A12) Alaska Redox With 2.5Y Hue ☑ Other (Explain in Remarks) Alaska Gleyed (A13) ^a One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ^a Give details of color change in Remarks. estrictive Layer (if present): Yes in a papropriate landscape position must be present. Hydric Soil Present? Yes (a)	. ,				-	l		ut Hue 5Y or Redder
Thick Dark Surface (A12) ³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed (A13) ⁴ Give details of color change in Remarks. estrictive Layer (if present): Type: seasonal frost Depth (inches): 10 estrictive Layer (if present): sistive reaction to alpha, alpha-dipyridol YDROLOGY YURCLOGY YURCLOGY Yugare Water (A1) Influction to alpha, alpha-dipyridol YURCLOGY YURCLOGY YURAL (A1) Influction to alpha, alpha-dipyridol YURCLOGY YURCLOGY Surface Water (A1) Influction training tra						ĺ		marks)
Alaska Gleyed (A13) A Den indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Redox (A14) Hydroic Soil Present? Yes No Depth (inches): Depth (inches): Surface Water Present? Yes No Depth (inches): Depth (inches): Surface Vater Present? Yes No Depth (inches): Depth (inches): Depth (inches): Surface Real Redox (B10) Ketland Hydrology Present? Yes No Depth (inches): Dep	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,)						-,
Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. estrictive Layer (if present): ¹ Ype: seasonal frost Depth (inches): 10 ¹ Hydric Soil Present? Yes ● No ● marks: ¹ Sive details of color change in Remarks. sisticitive reaction to alpha, alpha-dipyridol ¹ YPE ¹ OPCOLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ Give details of color change in Remarks ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ Sive reaction to alpha, alpha-dipyridol ¹ Sive reaction to alpha, alpha-dipyridol ¹ YPROLOGY ¹ Sive reaction to alpha, alpha-dipyridol ¹ Sive reactin to alpha, alpha-dipyridol	Alaska Gleyed (A13)	,						d hydrology,
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marks: sitive reaction to alpha, alpha-dipyridol							Hydric Soil Prese	nt? Yes 🖲 No 🔾
marks: sitive reaction to alpha, alpha-dipyridol YDROLOGY /etland Hydrology Indicators: 'rimary. Indicators (any one is sufficient) Surface Water (A1) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C1) Seturation (A3) Marl Deposits (B15) Seturation (A3) Marl Deposits (B15) Seturation (A3) Dry-Season Water Table (C2) Drift deposits (B2) Dry-Season Water Table (C2) Drift deposits (B3) Other (Explain in Remarks) Iron Deposits (B5) ✓ Surface Water Present? Yes No Depth (inches): urater Table Present? Yes No Depth (inches): generative reaction to alpha, alpha-dipyridol								
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aturation Present? ncludes capillary fringe) Yes No Depth (inches): 9 ecorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: emarks: positive reaction to alpha, alpha-dipyridol	 Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Surface Soil Cracks (B6) 			· ·				ographic Relief (D4)
Andudes capillary fringe) Yes Vo Depth (inches): 9 ecorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: marks: positive reaction to alpha, alpha-dipyridol	Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) eld Observations: urface Water Present?	Yes O N	□ c ₀ •	· ·			▼ FAC-neut	ographic Relief (D4) ral Test (D5)
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4positive reaction to alpha, alpha-dipyridol	 Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) ield Observations: urface Water Present? vater Table Present? aturation Present? includes capillary fringe) 	Yes ○ N Yes ○ N Yes ● N		Depth (inches): Depth (inches): Depth (inches):			▼ FAC-neut	ographic Relief (D4) ral Test (D5)
4positive reaction to alpha, alpha-dipyridol	 Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) ield Observations: urface Water Present? vater Table Present? aturation Present? includes capillary fringe) 	Yes ○ N Yes ○ N Yes ● N		Depth (inches): Depth (inches): Depth (inches):			▼ FAC-neut	ographic Relief (D4) ral Test (D5)
	 Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) ield Observations: urface Water Present? vater Table Present? aturation Present? includes capillary fringe) ecorded Data (stream gate) 	Yes ○ N Yes ○ N Yes ● N		Depth (inches): Depth (inches): Depth (inches):			▼ FAC-neut	ographic Relief (D4) ral Test (D5)
	Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Edd Observations: urface Water Present? Aturation Present?	Yes O N Yes O N Yes O N Yes No	○ ● o ● o ● well, aerial ph	Depth (inches): Depth (inches): Depth (inches):			▼ FAC-neut	ographic Relief (D4) ral Test (D5)

Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Other: positive reaction to alpha, alpha-dipyridol Wetland Hydrology Indicators: Saturation (A3), Presence of Reduced Iron (C4), Shallow Aquitard (D3).



Project/Site: Barrow Environmental Obseratory		Borough/City:	North Slo	pe Borough Sampling Date: 30-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-29
Investigator(s): SLI, EKJ		Landform (hill	side, terrac	e, hummocks etc.): Drained Lake Basin
Local relief (concave, convex, none): concave		Slope: 0.0	%/ 0.0	
	Let			
Subregion : Northern Alaska	Lal	71.282421666	00007	
Soil Map Unit Name:				NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this tir			● No ○	(If no, explain in Remarks.)
	-	tly disturbed?	Are "N	lormal Circumstances" present? Yes $oldsymbol{igstarrow}$ No $igstarrow$
Are Vegetation 🗋 , Soil 🔲 , or Hydrology 🛄 r	naturally p	problematic?	(If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map show	ving sa	mpling point	locations	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes $ullet$ No $igodot$		ls f	he Samr	pled Area
Hydric Soil Present? Yes 🖲 No 🔾			hin a We	
Wetland Hydrology Present? Yes $oldsymbol{igodol}$ No $igodol$		wit		
grasses.	several d	unlins in comm	unity. many	ra with moss. overall map as pem1f wet sedge tundra. 2 y goose scat, feathers, tracks. heavily grazed sedges and
VEGETATION - Use scientific names of plants. Lis	st all sp	ecies in the	plot.	
	Absolute		Indicator	Dominance Test worksheet:
	% Cove	r Species?	Status	Number of Dominant Species
1				That are OBL, FACW, or FAC: <u>1</u> (A)
2		. Ц		Total Number of Dominant Species Across All Strata: 1 (B)
3		. Ц		Percent of dominant Species
4		. Ц		That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
5		. 🗌		Prevalence Index worksheet:
Total Cover:		_		Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover:	0 209	% of Total Cover:	0	OBL Species 33 x 1 = 33
1				FACW Species $10 \times 2 = 20$
2				FAC Species $0 \times 3 = 0$
3				FACU Species $0 \times 4 = 0$
4				UPL Species $0 \times 5 = 0$
5		. Ц		
6	-	. Ц		Column Totals: <u>43</u> (A) <u>53</u> (B)
7		. Ц		Prevalence Index = B/A = <u>1.233</u>
8		. Ц		Hydrophytic Vegetation Indicators:
9				✓ Dominance Test is > 50%
10				✓ Prevalence Index is ≤ 3.0
Total Cover: 50% of Total Cover:		-	0	Morphological Adaptations ¹ (Provide supporting data in
Herb Stratum				Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
1. Eriophorum angustifolium			OBL	
2. Arctophila fulva	5	-	OBL	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. Eriophorum russeolum		-	FACW	
4. Dupontia fischeri 5. Ranunculus pallasii	2		FACW	
				Plot size (radius, or length x width) <u>r=15m</u>
6				% Cover of Wetland Bryophytes (Where applicable)
7				% Bare Ground
8		·		Total Cover of Bryophytes 35
9	0	·		
10				Hydrophytic Vegetation
50% of Total Cover: 2			8.6	Present? Yes • No

50% of Total Cover: <u>21.5</u> 20% of Total Cover:

8.6

WETLAND DETERMINATION DATA FORM - Alaska Region

Remarks: bryophytes include scosco

Depth -	Ma			Rec	lox Featu	1100		-	
(inches)	Color (moist)	<u> </u>	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-5			100					Fibric Organics	
5-12			100					Hemic Organics	
									-
									-
				,				- ,	
Type: C=Conc	entration. D=De	pletion. RI	M=Reduce	d Matrix ² Location	: PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
lydric Soil Ir	ndicators:			Indicators for I	Problema	tic Hydric	Soils ³ :		
Histosol or	Histel (A1)			Alaska Color C	hange (T	A4) ⁴		Alaska Gleyed Withou	t Hue 5Y or Redder
Histic Epip	edon (A2)			Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydrogen	Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rem	narks)
Thick Dark	Surface (A12)								
Alaska Gle	yed (A13)							imary indicator of wetland	hydrology,
Alaska Red	lox (A14)			and an appropria	ate landsca	ape position	must be p	present.	
Alaska Gle	yed Pores (A15)			⁴ Give details of	color chan	ige in Remai	rks.		
-	r (if present):								• • •
Type: sea	sonal frost							Hydric Soil Presen	t? Yes 🖲 No 🔾
Depth (inch	es): 12								
emarks:									
emarks: YDROLO	GY							Socondary In	dicators (2 or more required)
emarks: YDROLO(/etland Hydr	GY rology Indicato		ient)						dicators (2 or more required)
YDROLO YDROLO	GY rology Indicato ators (any one		ient)		visible on	Acrial Imag	on (187)	Water Stai	ned Leaves (B9)
rmarks: YDROLO(Yetland Hydr rrimary Indic Surface W	GY ology Indicato ators (any one ater (A1)		ient)	Inundation		-		Water Stai	ned Leaves (B9) Patterns (B10)
YDROLO (Vetland Hydr rimary Indic Surface W ✓ High Wate	GY ology Indicato cators (any one cater (A1) er Table (A2)		ient)	Sparsely Ve	getated Co	-		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3)
Pmarks: YDROLO(Vetland Hydr Timary Indic Surface W ✓ High Wate ✓ Saturation	GY rology Indicato ators (any one ater (A1) er Table (A2) (A3)		ient)	Sparsely Ver	getated Co ts (B15)	oncave Surfa		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4)
Marks: (DROLO) Tetland Hydr rimary Indic Surface W High Water Saturation Water Mai	GY rology Indicato ators (any one ater (A1) er Table (A2) (A3) rks (B1)		ient)	Sparsely Ver	getated Co ts (B15) ulfide Odo	oncave Surfa		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5)
YDROLOO YDROLOO Yetland Hydr Imary Indic Surface W ✓ High Wate ✓ Saturation Water Mai	GY rology Indicato ators (any one ater (A1) er Table (A2) (A3) rks (B1) Deposits (B2)		ient)	Sparsely Ver Marl Deposi Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Stai Drainage F Oxidized R Presence c Salt Depos	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4)
YDROLO(/etland Hydr /rimarv Indic Surface W ✓ High Wate ✓ Saturation Water Mai Sediment Drift depo	GY rology Indicato ators (any one ater (A1) er Table (A2) (A3) rks (B1) Deposits (B2) sits (B3)		ient)	Sparsely Ver	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Stail Water Stail Drainage F Oxidized R Presence c Salt Depos Stunted or Geomorph	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2)
Primarks: Primary Indic Surface W High Wate Saturation Water Mai Sediment Drift depo Algal Mat	GY rology Indicato rators (any one rater (A1) rr Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4)		ient)	Sparsely Ver Marl Deposi Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Stail Drainage F Oxidized R Presence c Salt Depose Stunted or Geomorph ✓ Shallow Ac	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3)
Primarks: Primary Indic Primary Indic Surface W Primary Indic Saturation Water Mar Saturation Water Mar Agal Mat Iron Depo	GY rology Indicato rators (any one rater (A1) rr Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4)		ient)	Sparsely Ver Marl Deposi Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Stail Drainage F Oxidized R Presence c Salt Depose Stunted or Geomorph ✓ Shallow Ac	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) hits (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4)
Primarks: YDROLOO Yetland Hydr Primary Indic Surface W ✓ High Water ✓ Saturation Water Mai Sediment Drift depo Algal Mat ✓ Iron Depo Surface Sc	GY rology Indicato ators (any one ater (A1) er Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6)		ient)	Sparsely Ver Marl Deposi Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Stail Water Stail Drainage F Oxidized R Presence of Salt Depos Stunted or Geomorph V Shallow Ac Microtopos	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) hits (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4)
Primarks: YDROLOO Yetland Hydr Primary Indic Surface W ✓ High Wate ✓ Saturation Water Mar ✓ Saturation Unift depo Algal Mat ✓ Iron Depo Surface Sc ield Observa	GY rology Indicator rators (any one rater (A1) rater (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) pil Cracks (B6) tions:		ient) No 💿	Sparsely Ver Marl Deposi Hydrogen St Dry-Season	getated Co ts (B15) ulfide Odo Water Tal ain in Rem	oncave Surfa or (C1) ble (C2)		Water Stail Water Stail Drainage F Oxidized R Presence of Salt Depos Stunted or Geomorph V Shallow Ac Microtopos	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) hits (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4)
Primarks: YDROLO(/etland Hydr Primary Indic Surface W ✓ High Wate ✓ Saturation Water Mar Sediment Drift depo Algal Mat ✓ Iron Depo Surface Sc ield Observa urface Water	GY cology Indicator cators (any one ater (A1) er Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present?	e is suffic	No •	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Expla	getated Ca ts (B15) ulfide Odc Water Tal ain in Rem thes):	oncave Surfa or (C1) ble (C2) harks)		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primarks: YDROLOO /etland Hydr Primarv Indic Surface W ✓ High Wate ✓ Saturation Water Mai Sediment Drift depo Algal Mat ✓ Iron Depo Surface So ield Observa urface Water I /ater Table Pri	GY rology Indicato rators (any one rater (A1) rater (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? esent?	e is suffic Yes ○ Yes ●	No ⊙ No ◯	 ✓ Sparsely Veg Marl Deposi Hydrogen Si Dry-Season Other (Explain 	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem thes):	ncave Surfa or (C1) ble (C2) narks)		Water Stail Water Stail Drainage F Oxidized R Presence of Salt Depos Stunted or Geomorph V Shallow Ac Microtopos	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primary Indic Vetland Hydr Primary Indic Surface W ✓ High Wate ✓ Saturation Water Mar Sediment Drift depo Algal Mat ✓ Iron Depo Surface So Surface So Surface Water Vater Table Pre- Saturation Pres	GY rology Indicato ater (A1) er Table (A2) (A3) eks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) titons: Present? esent? ent?	e is suffic	No •	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Expla	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem thes):	oncave Surfa or (C1) ble (C2) harks)		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primary Indic Vetland Hydr Primary Indic Surface W ✓ High Wate ✓ Saturation ○ Water Mar ○ Sediment ○ Drift depo ○ Algal Mat ✓ Iron Depo ○ Algal Mat ✓ Iron Depo ○ Surface So Sinface Water I Vater Table Pres Saturation Press includes capilla	GY rology Indicato ater (A1) er Table (A2) (A3) erks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? esent? ent? any fringe)	e is suffic Yes ○ Yes ● Yes ●	No	 ✓ Sparsely Veg Marl Deposi Hydrogen Si Dry-Season Other (Explain 	getated Cd ts (B15) ulfide Odo Water Tal ain in Rem hes):	0 (C1) ble (C2) harks) 1 0		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primary India Surface W High Wate Surface W High Wate Saturation Sediment Drift depo Algal Mat Jorift depo Algal Mat Sediment Drift depo Algal Mat Surface Saturation Pressincludes capilla acorded Dat	GY rology Indicato ater (A1) er Table (A2) (A3) erks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? esent? ent? any fringe)	e is suffic Yes ○ Yes ● Yes ●	No	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odo Water Tal ain in Rem hes):	0 (C1) ble (C2) harks) 1 0		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primary Indic Surface W High Wate Saturation Sediment Drift depo Algal Mat Iron Depo Surface Vater Table Pri Gurface Water I Surface Water I Surface Water I Surface Water I Saturation Press includes capilla ecorded Date	GY rology Indicato ater (A1) er Table (A2) (A3) erks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? esent? ent? any fringe)	e is suffic Yes ○ Yes ● Yes ●	No	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odo Water Tal ain in Rem hes):	0 (C1) ble (C2) harks) 1 0		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
Primary Indic Surface W High Wate Saturation Water Mai Sediment Drift depo Algal Mat Iron Depo Surface So Gurface Water I Vater Table Pri Gurface Water I Vater Table Pri Saturation Press includes capilla ecorded Data	GY rology Indicato rators (any one fater (A1) rr Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? ent? ent? ary fringe) a (stream gauge	e is suffic Yes ○ Yes ● Yes ●	No	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odo Water Tal ain in Rem hes):	0 (C1) ble (C2) harks) 1 0		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
YDROLO Vetland Hydr Primary Indic Surface W ✓ High Wate ✓ Saturation Water Mai Sediment Drift depo Algal Mat ✓ Iron Depo Surface Sc ield Observa urface Water Vater Table Pri aturation Press includes capilla ecorded Date	GY rology Indicato rators (any one fater (A1) rr Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) bil Cracks (B6) tions: Present? ent? ent? ary fringe) a (stream gauge	e is suffic Yes ○ Yes ● Yes ●	No	Sparsely Ver Marl Deposi Hydrogen Si Dry-Season Other (Explain Depth (inc Depth (inc Depth (inc	getated Cd ts (B15) ulfide Odo Water Tal ain in Rem hes):	0 (C1) ble (C2) harks) 1 0		Water Stai	ned Leaves (B9) Patterns (B10) hizospheres along Living Roots (C3) of Reduced Iron (C4) its (C5) Stressed Plants (D1) ic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)

Wetland Functional Class: Semipermanently Flooded Wet Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5).



PEM1F

Project/Site: Barrow Environmental Obseratory	Bo	prough/City:	North Slo	pe Borough Sampling Date:30-Jul-15
Applicant/Owner: UIC				Sampling Point: BEO-30
nvestigator(s): SLI, EKJ	L	andform (hil	lside, terrac	e, hummocks etc.): Slough
_ocal relief (concave, convex, none):concave		Slope: 0.0		
Subregion : Northern Alaska	Lat.: 7	1.28669333	33333	Long.: -156.44724 Datum: WGS84
Soil Map Unit Name:	_			NWI classification: E2USP
Are climatic/hydrologic conditions on the site typical for this Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology SUMMARY OF FINDINGS - Attach site map sh	significantly naturally pro	disturbed? blematic?	(If nee	(If no, explain in Remarks.) lormal Circumstances" present? Yes ● No ○ eded, explain any answers in Remarks.) s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		ls i	the Samr	pled Area
Hydric Soil Present? Yes ● No ○			thin a We	
Wetland Hydrology Present? Yes No				
Common goose scat, tracks, feathers.				e of site visit, current water level about 12in below OHW.
	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum1.	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
				Total Number of Dominant
2				Species Across All Strata:(B)
1				Percent of dominant Species
5.				That Are OBL, FACW, or FAC: 0.0% (A/B)
Total Cove	er: 0			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:		of Total Cover	: 0	Total % Cover of: Multiply by:
				OBL Species x 1 =
1 2.				FACW Species $0 \times 2 = 0$
3.				FAC Species $0 \times 3 = 0$
4.				FACU Species $0 \times 4 = 0$
5.				UPL Species <u>0</u> x 5 = <u>0</u>
6.				Column Totals: <u>0</u> (A) <u>0</u> (B)
7.				Prevalence Index = B/A = 0.000
8.				
9				Hydrophytic Vegetation Indicators: Dominance Test is > 50%
10				$\square Prevalence Index is \leq 3.0$
Total Cover: 50% of Total Cover:	er: <u>0</u> 0 20%	of Total Cover	:	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1	0			✓ Problematic Hydrophytic Vegetation ¹ (Explain)
2.				¹ Indicators of hydric soil and wetland hydrology must
				be present, unless disturbed or problematic.
3.	0			
3 4				
3 4 5	0			Plot size (radius, or length x width)
4. 5. 6.	0 0 0			% Cover of Wetland Bryophytes
4. 5. 6. 7.				% Cover of Wetland Bryophytes
4. 5. 6. 7. 8.				% Cover of Wetland Bryophytes (Where applicable) % Bare Ground
4. 5. 6. 7. 8. 9.				% Cover of Wetland Bryophytes (Where applicable) % Bare Ground Total Cover of Bryophytes
4. 5. 6. 7. 8.				% Cover of Wetland Bryophytes (Where applicable) % Bare Ground

WETLAND DETERMINATION DATA FORM - Alaska Region

-		e depth need atrix	ed to docume	ent the indicator or con Red	firm the at		ators)		
Depth (inches)	Color (mois		%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
		·/							
¹ Type: C=Co	ncentration. D=D	epletion. RI	M=Reduced	d Matrix ² Location	: PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
Hydric Soil		-		Indicators for P					
Histosol	or Histel (A1)			Alaska Color C	hange (T	A4) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
	ipedon (A2)			Alaska Alpine	swales (T	A5)		Underlying Layer	
Hydroge	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		✓ Other (Explain in Rema	arks)
Thick Da	rk Surface (A12)								
🗌 Alaska G	leyed (A13)							imary indicator of wetland	hydrology,
🗌 Alaska R	edox (A14)			and an appropria	te landsc	ape position	must be p	resent.	
🗌 Alaska G	leyed Pores (A15)		⁴ Give details of o	color char	ige in Remar	ks.		
Restrictive La	ver (if present):								
Type:								Hydric Soil Present	:? Yes 🖲 No 🔿
Depth (in	ches):								
HYDROLO									
-	drology Indicat								licators (2 or more required)
Surface	icators (any or	ie is suffic	ent)		/icible.on	Acricl Image			ed Leaves (B9) atterns (B10)
	ter Table (A1)			Inundation \		-			izospheres along Living Roots (C3)
Saturatio	. ,			Marl Deposit					Reduced Iron (C4)
Water M	. ,			Hydrogen Su	. ,	or (C1)		Salt Deposi	
	t Deposits (B2)			Dry-Season					Stressed Plants (D1)
Drift dep				Other (Expla				Geomorphic	. ,
	t or Crust (B4)					/		Shallow Aqu	
✓ Iron Dep								Microtopog	raphic Relief (D4)
Surface	Soil Cracks (B6)							FAC-neutra	l Test (D5)
Field Observ	ations:	0	0						
Surface Wate	r Present?	Yes 🖲	No 〇	Depth (inc	hes):	36			
Water Table	Present?	Yes \bigcirc	No 🖲	Depth (inc	hes):		Wet	and Hydrology Prese	nt? Yes 🖲 No 🔾
Saturation Pr (includes cap		$_{\rm Yes}$ \bigcirc	No 🖲	Depth (inc	hes):				
			or well, a	erial photo, previ		ection), if a	vailable:		
Remarks:		DE ince (L						
temp 53	ep open water.	B5Iron t	IOC, C4D	logenic sneen					
ec > 20mS/c	:m.								

E2USP Wetland Functional Class: Estuarine Waters Wildlife Habitat: Brackish Water



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1), Iron Deposits (B5), Geomorphic Position (D2).

No Photo

	WETLAND DETERM		A FORM - Alaska	Region	
Project/Site: Barrow Environmental	Obseratory	Borough/City:	North Slope Borough	Sampling Date:	30-Jul-15
Applicant/Owner: UIC				Sampling Point:	BEO-31
Investigator(s): SLI, EKJ		Landform (hill	side, terrace, hummocl	ks etc.): Swale	
Local relief (concave, convex, none):	concave	Slope: 3.0	% / <u>1.7</u> ° Eleva	tion: 5	
Subregion : Northern Alaska	Lat.:	71.28645	Long.: -1	56.4471466666667	Datum: WGS84
Soil Map Unit Name:			I	WI classification: PEM1	т
Are Vegetation D , Soil 🗹	, or Hydrology Significan , or Hydrology naturally	ntly disturbed? problematic?	Are "Normal Circu (If needed, explair	any answers in Remarks.	,
SUMMARY OF FINDINGS - At		ampling point	locations, transec	ts, important features,	, etc.
Hydrophytic Vegetation Present?	Yes 🔍 No 🔾	ls f	the Sampled Area		
Hydric Soil Present?	Yes 🕙 No 🔾		hin a Wetland?	Yes ● No〇	
Wetland Hydrology Present?	Yes $ullet$ No $igcap$	White the second		100 - 110 -	
Remarks: swale connecting to wate narrow, sparsely vegetate code.	er characterized by BEO-30, no ed feature. Plot centered in low				
VEGETATION - Use scientific r	names of plants. List all s	pecies in the	plot.		
	Absolut		Indicator	e Test worksheet:	
Tree Stratum	<u>% Cov</u>	er <u>Species?</u>		Dominant Species	1 (A)
I				BL, FACW, or FAC:	<u>1</u> (A)
2.				ber of Dominant cross All Strata:	<u>1</u> (B)
3		_ 🗆			

		50% of Total Cover: 2.85		f Total Cover:	1.14	Present? Yes No	
10.			5.7			Hydrophytic Vegetation	
			0				
8.			0.1		FACU	Total Cover of Bryophytes	
7.	Puccinellia phryganodes		0.1		OBL	% Bare Ground 99	
6.			0.1		OBL	% Cover of Wetland Bryophytes	
5.			0.1		OBL	Plot size (radius, or length x width) <u>r=5m</u>	
4.			0.1		OBL		
3.	Arctophila fulva		0.1		OBL	be present, unless disturbed or problematic.	
2.	Eriophorum angustifolium		0.1		OBL	¹ Indicators of hydric soil and wetland hydrology must	
1.	Dupontia fischeri		5	\checkmark	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)	
He	erb Stratum	50% of Total Cover:	 20% o	f Total Cover:	0	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
10.						✓ Prevalence Index is ≤3.0	
						\checkmark Dominance Test is > 50%	
						Hydrophytic Vegetation Indicators:	
						Prevalence Index = B/A = <u>1.930</u>	
6.						Column Totals: <u>5.7</u> (A) <u>11.00</u> (B)	
5.							
						FACU Species <u>0.1</u> x 4 = <u>0.400</u> UPL Species <u>0</u> x 5 = <u>0</u>	
						FAC Species 0 x 3 = 0 FACU Species 0.1 x 4 = 0.400	
						FACW Species 5 $x 2 = 10$	
1.						OBL Species 0.6 x 1 = 0.6	
Sap	ling/Shrub Stratum	50% of Total Cover: 0		f Total Cover:	0	Total % Cover of: Multiply by:	
		Total Cover:	0			Prevalence Index worksheet:	
ч. 5.						That Are OBL, FACW, or FAC:(A/B)	
3. 4.						Percent of dominant Species	
3.						Species Across All Strata: (B)	

Remarks: trace viviparous poa (Poa pratensis ssp colpodea [Skinner et al. 2012]), this is likely the small poa observed at previous plots. No separate indicator status for subspecies, entered as Poa pratensis (FACU).

(inches)	Color (moi 2.5Y	st)			Reu	ox Featu	ires			
7-8	2.5Y		%	Color (n	noist)	%	Type ¹	Loc 2	Texture	Remarks
-	2.5Y		100						Hemic Organics	
8-19		3/2	100						Silty Clay Loam	
	N	3/1	70	Ν	2.5/1	30		M	Silty Clay Loam	dark colors at organic inclusions
pe: C=Conce		Depletion. F	M=Reduce		² Location:				annel. M=Matrix	
Histosol or H				_	aska Color Ch				Alaska Gleyed Withou	t Hue 5Y or Redder
Histic Epipe	. ,			🗌 Ala	aska Alpine s	wales (T/	45)		Underlying Layer	
Hydrogen S				🗌 Ala	iska Redox V	Vith 2.5Y	Hue		Other (Explain in Rem	narks)
Alaska Gleye Alaska Redo				and a	indicator of n appropriat e details of co	e landsca	ape position	must be p	imary indicator of wetland resent.	hydrology,
strictive Layer	(if present):									
Type: seas									Hydric Soil Presen	it? Yes 🖲 No 🔿
Depth (inche										-
DROLOG	9Y									
etland Hydro	ology Indica	itors:							Secondary In	dicators (2 or more required)
imary Indica		ne is suffic	cient)						Water Stai	ned Leaves (B9)
Surface Wa	· · /			I	nundation V	isible on	Aerial Imag	ery (B7)		Patterns (B10)
High Water	. ,			_	Sparsely Veg		oncave Surfa	ace (B8)		hizospheres along Living Roots (C3
Saturation (. ,			<u> </u>	Aarl Deposits	s (B15)			_	of Reduced Iron (C4)
Water Mark				L F	Hydrogen Su	lfide Odo	r (C1)		Salt Depos	sits (C5)
Sediment D	,				Dry-Season W	Vater Tal	ole (C2)		_	Stressed Plants (D1)
Drift deposi	. ,				Other (Explai	n in Rem	arks)			ic Position (D2)
Algal Mat o									Shallow Ac	quitard (D3)
Iron Depos	. ,									graphic Relief (D4)
Surface Soi	il Cracks (B6)							1	✓ FAC-neutra	al Test (D5)
		O						-		
	resent?	Yes O	No 🖲		Depth (inch	ies):				_
	sent?	Yes 🖲	No 〇		Depth (inch	ies):	1	Wet	and Hydrology Pres	ent? Yes $ullet$ No $igodom$
rface Water P ater Table Pres		Yes 💿	No \bigcirc		Depth (inch		0]		
rface Water Preater Table Preater Table Preaturation Prese cludes capillar	ry fringe)									
eld Observat urface Water Pr ater Table Pre- aturation Prese ncludes capillar ecorded Data	ry fringe)		itor well, a	erial ph	ioto, previc	ous inspe	ection), if a	available:		
urface Water Pre- ater Table Pre- aturation Prese Includes capillar ecorded Data	ry fringe)		itor well, a	erial ph	ioto, previd	ous inspe	ection), if a	available:		
urface Water Pre- ater Table Pre- aturation Prese includes capillar ecorded Data marks:	ry fringe)		itor well, a	erial ph	ioto, previo	ous inspe	ection), ir a	available:		
arface Water Pre- ater Table Pre- aturation Prese ncludes capillar ecorded Data marks: iron floc	ry fringe) a (stream ga		itor well, a	erial ph	ioto, previo	ous inspe	ection), ir a	available:		
urface Water Pre- ater Table Pre- aturation Prese includes capillar ecorded Data marks:	ry fringe) a (stream ga		itor well, a	erial ph	ioto, previc	ous inspe		available:		

Wetland Functional Class: Semipermanently Flooded Tidal Graminoid Meadow Wildlife Habitat: Halophytic Sedge Wet Meadow



Hydric Soil Indicators: Alaska Gleyed w/o Hue 5Y or Redder Underlying Layer. Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5).



PEM1T

Project					- Alaska Region pe Borough Sampling Date: 30-Jul-15
Applica	nt/Owner: UIC				Sampling Point: BEO-32
••	jator(s): SLI, EKJ	La	ndform (hil	lside, terrac	e, hummocks etc.): Flat
Local r	elief (concave, convex, none): none	SI	lope: 0.0	%/ 0.0	° Elevation: 10
Subrea	ion : Northern Alaska	 Lat.: 71	.28664333	 33333	Long.: -156.4490366666667 Datum: WGS84
-	p Unit Name:	<u>.</u>			NWI classification: PEM1B
	natic/hydrologic conditions on the site typical for this	s time of year?	Yes	• No ()	(If no, explain in Remarks.)
	\square , Soil \square , or Hydrology \square	-			lormal Circumstances" present? Yes \bigcirc No \bigcirc
	egetation, Soil 🗹 , or Hydrology				eded, explain any answers in Remarks.)
	IARY OF FINDINGS - Attach site map sh		ling point	locations	s, transects, important features, etc.
	Irophytic Vegetation Present? Yes 💿 No 🔾		ls	the Samp	oled Area
-	Iric Soil Present? Yes 🔍 No 🔾			thin a We	
	tland Hydrology Present? Yes ● No ○ arks: nonpatterned mesic grass tundra.				
/EGE	TATION - Use scientific names of plants.	List all speci	es in the	nlot	
	· · · ·	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tr</u> 1.	ee Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
2.					Total Number of Dominant
3.					Species Across All Strata:4_ (B)
4.					Percent of dominant Species
5.					That Are OBL, FACW, or FAC:
	Total Cov	/er:			Prevalence Index worksheet:
Sap	ing/Shrub Stratum 50% of Total Cover:	20% of	Total Cover	:	Total % Cover of: Multiply by:
1.					OBL Species 10 x 1 = 10
2.					FACW Species 20.1 x 2 = 40.20
3.					FAC Species <u>18.1</u> x 3 = <u>54.30</u> FACU Species <u>10</u> x 4 = <u>40</u>
4.					FACU Species10 $x 4 =$ 40UPL Species0 $x 5 =$ 0
5.					
6.		<u></u>			Column Totals: <u>58.2</u> (A) <u>144.5</u> (B)
7.					Prevalence Index = B/A = _2.483_
					Hydrophytic Vegetation Indicators:
					Dominance Test is > 50%
10.	Total Cov				✓ Prevalence Index is ≤3.0
			Total Cover	: 0	Morphological Adaptations ¹ (Provide supporting data in
_ <u>H</u> e	erb Stratum 50% of Total Cover:	20/001			Remarks or on a separate sheet)
_ H e	Petasites frigidus 50% of Total Cover:	10		FACW	Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
	erb Stratum				Problematic Hydrophytic Vegetation ¹ (Explain)
1.	e rb Stratum Petasites frigidus	<u> </u>		FACW	
1. 2.	Petasites frigidus Alopecurus magellanicus Peo pratonsis	10 10 10 10		FACW	Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
1. 2. 3.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica	10 10 10 10 5	> >	FACW FACW FACU FAC OBL	Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
1. 2. 3. 4.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica Eriophorum angustifolium Eriophorum scheuchzeri	10 10 10 10 5 5 5	> >	FACW FACW FACU FAC OBL OBL	Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes
1. 2. 3. 4. 5. 6. 7.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica Eriophorum angustifolium Eriophorum scheuchzeri Saxifraga nelsoniana	10 10 10 10 5 5 5 5	> >	FACW FACW FACU FAC OBL OBL FAC	 Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable)
1. 2. 3. 4. 5. 6. 7. 8.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica Eriophorum angustifolium Eriophorum scheuchzeri Saxifraga nelsoniana Luzula confusa	$ \begin{array}{c} 10\\ 10\\ 10\\ 5\\ 5\\ 5\\ 5\\ 3\\ 3\\ \end{array} $	> >	FACW FACW FACU FAC OBL OBL FAC FAC	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) r=15m % Cover of Wetland Bryophytes (Where applicable) % Bare Ground
1. 2. 3. 4. 5. 6. 7. 8. 9.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica Eriophorum angustifolium Eriophorum scheuchzeri Saxifraga nelsoniana Luzula confusa Saxifraga cernua	$ \begin{array}{c} 10\\ 10\\ 10\\ 5\\ 5\\ 5\\ 3\\ 0.1\\ \end{array} $	> >	FACW FACU FACU FAC OBL OBL FAC FAC FAC	Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground Total Cover of Bryophytes
1. 2. 3. 4. 5. 6. 7. 8.	Petasites frigidus Alopecurus magellanicus Poa pratensis Poa arctica Eriophorum angustifolium Eriophorum scheuchzeri Saxifraga nelsoniana Luzula confusa	$ \begin{array}{c} 10\\ 10\\ 10\\ 5\\ 5\\ 5\\ 3\\ 0.1\\ 0.1\\ \end{array} $	> >	FACW FACW FACU FAC OBL OBL FAC FAC	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) r=15m % Cover of Wetland Bryophytes (Where applicable) % Bare Ground

Remarks: trace saxhir, saxhie. Viviparous Poa pratensis ssp colpodea [Skinner et al. 2012]), no separate indicator status for subspecies, entered as Poa pratensis (FACU). Low confidence in Saxnel ID--saxifrage, leaves and distribution match Hulten.

Depth M	latrix	to document the	e indicator or co Rec	firm the at		ators)		
(inches) Color (mois	st) %	o Colo	r (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-1	10	00					Hemic Organics	
1-9 10YR	3/2 8	5 5YR	3/2	15	<u>с</u>	PL	Silt Loam	positive reaction to alpha alpha dipyrido
							·	
Type: C=Concentration. D=I	Depletion. RM	=Reduced Mat	trix ² Locatior	1: PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
Hydric Soil Indicators:		In	dicators for I	Problema	tic Hydric	Soils ³ :		
Histosol or Histel (A1)		_	Alaska Color (Alaska Gleyed Withou	It Hue 5Y or Redder
Histic Epipedon (A2)			Alaska Alpine				Underlying Layer	
Hydrogen Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		✓ Other (Explain in Rer	narks)
Thick Dark Surface (A12))	3 0)ne indicator o	fhydroph	vtic vegetati	ion one pr	imany indicator of wetland	l hydrology
Alaska Gleyed (A13)			d an appropria				imary indicator of wetland resent.	i riyai ology,
 Alaska Redox (A14) Alaska Gleyed Pores (A15) 	5)	4 -	Give details of		an in Daw	-		
	5)	. (live details of	color chan	ige in Rema	rks.		
estrictive Layer (if present):								
Type: seasonal frost							Hydric Soil Preser	nt? Yes $ullet$ No $igodom$
Depth (inches): 9								
Remarks: positive reaction to alpha,	alpha-dipyrio	lob						
	alpha-dipyrio	dol						
ositive reaction to alpha,	alpha-dipyrio	dol						
ositive reaction to alpha,		dol					Secondary Ir	dicators (2 or more required)
ositive reaction to alpha, YDROLOGY Vetland Hydrology Indica	itors:						Water Sta	ined Leaves (B9)
YDROLOGY Vetland Hydrology Indica Primary Indicators (any or	itors:		Inundation		-		Water Sta	ined Leaves (B9) Patterns (B10)
YDROLOGY Yetland Hydrology Indica Primary Indicators (any or Surface Water (A1) High Water Table (A2)	itors:		Sparsely Ve	getated Co	-		Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3)
YDROLOGY Yetland Hydrology Indica Primary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3)	itors:		Sparsely Ve	getated Co ts (B15)	oncave Surfa		Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4)
YDROLOGY Yetland Hydrology Indica Primary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	itors:		Sparsely Ve Marl Deposi Hydrogen S	getated Co ts (B15) ulfide Odo	oncave Surfa or (C1)		Water Sta Drainage Oxidized F ✓ Presence 0 Salt Deposition	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5)
YDROLOGY Yetland Hydrology Indicators Primary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	itors:		Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Presence 0 Salt Depos Stunted o	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1)
YDROLOGY Yetland Hydrology Indicators Primary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3)	itors:		Sparsely Ve Marl Deposi Hydrogen S	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) hic Position (D2)
YDROLOGY Yetland Hydrology Indicators Primary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	itors:		Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Salt Depos Stunted o Geomorph ✓ Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3)
YDROLOGY Yetland Hydrology Indicators Primary Indicators (anv or Surface Water (A1) High Water Table (A2) ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4)	itors: ne is sufficie		Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Salt Depos Stunted o Geomorph ✓ Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
YDROLOGY Yetland Hydrology Indica Primary Indicators (any or 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)	itors: ne is sufficie	int)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated Co ts (B15) ulfide Odo Water Tal	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Salt Depos Stunted or Geomorph ✓ Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
YDROLOGY Yetland Hydrology Indica Primary Indicators (any or 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)	ntors: ne is sufficie Yes 〇	nt)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season	getated Co ts (B15) ulfide Odo Water Tal ain in Rem	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Salt Depos Stunted or Geomorph ✓ Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
YDROLOGY Vetland Hydrology Indicators Primary Indicators (any or 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)	ntors: ne is sufficie Yes 〇	int)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Explanation)	getated Co ts (B15) ulfide Odc Water Tal ain in Rem thes):	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Salt Depos Stunted or Geomorph ✓ Shallow A	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
IYDROLOGY Wetland Hydrology Indica Primary Indicators (any or 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present?	ne is sufficie	nt)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expland) Depth (incompart)	getated Cd ts (B15) ulfide Odd Water Tal ain in Rem hes):	oncave Surfa or (C1) ble (C2)		Water Sta Drainage Oxidized F ✓ Presence G Salt Depos Stunted o Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
IYDROLOGY Wetland Hydrology Indica Primary Indicators (any or 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)	ntors: ne is sufficie Yes O Yes O Yes O	nt)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla Depth (inc Depth (inc Depth (inc	getated Co ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa	 Wet	Water Sta Drainage Oxidized F ✓ Presence G Salt Depos Stunted o Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
IYDROLOGY Wetland Hydrology Indica Primary Indicators (any or 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Saturation Present? Recorded Data (stream gate)	ntors: ne is sufficie Yes O Yes O Yes O	nt)	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla Depth (inc Depth (inc Depth (inc	getated Co ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa	 Wet	Water Sta Drainage Oxidized F ✓ Presence G Salt Depos Stunted o Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)
IYDROLOGY Wetland Hydrology Indica Primarv Indicators (any or 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) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Saturation Present? (includes capillary fringe)	Yes Yes Yes Yes Yes Yes Yes Yes	No () No () No () No () r well, aerial	Sparsely Ve Marl Deposi Hydrogen S Dry-Season Other (Expla Depth (inc Depth (inc Depth (inc	getated Co ts (B15) ulfide Odo Water Tal ain in Rem hes):	oncave Surfa	 Wet	Water Sta Drainage Oxidized F ✓ Presence G Salt Depos Stunted o Geomorph ✓ Shallow A Microtopo ✓ FAC-neutr	ined Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) sits (C5) r Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) al Test (D5)

Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Other: positive reaction to alpha, alpha-dipyridol. Wetland Hydrology Indicators: Saturation (A3), Presence of Reduced Iron (C4), Shallow Aquitard (D3).



roject/Site: Barrow Environmental Obseratory				- Alaska Region pe Borough Sampling Date: 30-Jul-15
pplicant/Owner: UIC				Sampling Point: BEO-33
vestigator(s): SLI, EKJ	L	andform (hil	side, terrac	e, hummocks etc.): Lake
ocal relief (concave, convex, none):concave	S	lope: 0.0	%/ 0.0	^e Elevation: 15
ubregion : Northern Alaska	Lat.: 71	.285371666	66667	Long.: -156.46852 Datum: WGS84
il Map Unit Name:				NWI classification: L1UBH
e climatic/hydrologic conditions on the site typical for this	time of year?	Yes	• No ()	(If no, explain in Remarks.)
re Vegetation 🗌 , Soil 🗌 , or Hydrology 🗌	significantly of	disturbed?	Are "N	ormal Circumstances" present? Yes 🔍 No 🔾
re Vegetation 🗹 , Soil 🗹 , or Hydrology 🗌	naturally prob	plematic?	(If nee	ded, explain any answers in Remarks.)
JMMARY OF FINDINGS - Attach site map sho	wing samr	lina point	locations	s transects important features etc
Hydrophytic Vegetation Present? Yes \bullet No \bigcirc				·
Hydric Soil Present? Yes No		ls	the Samp	oled Area
Wetland Hydrology Present?		wit	thin a We	etland? Yes $ullet$ No $iglood$
	abundant do	ose scat fea	there track	s on shore. no lacustrine fringe wetlands in vicinity of plo
GETATION - Use scientific names of plants. I	List all speci	ies in the Dominant	•	Dominance Test worksheet:
Tree Stratum	% Cover	Species?	Status	Number of Dominant Species
1				That are OBL, FACW, or FAC:(A)
2				Total Number of Dominant Species Across All Strata: 0 (B)
3				Percent of dominant Species
4 5				That Are OBL, FACW, or FAC: 0.0% (A/B)
Total Cove	er: 0			Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:		f Total Cover	0	Total % Cover of: Multiply by:
				OBL Species <u>0</u> x 1 = <u>0</u>
2.				FACW Species <u>0</u> x 2 = <u>0</u>
3.				FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0
4.				
5.				
6				Column Totals: <u>0</u> (A) <u>0</u> (B)
7				Prevalence Index = B/A =0.000
8.				Hydrophytic Vegetation Indicators:
9				Dominance Test is > 50%
10Total Cove	er:			Prevalence Index is ≤3.0
_Herb Stratum50% of Total Cover:		f Total Cover	:	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1	0			\checkmark Problematic Hydrophytic Vegetation ¹ (Explain)
2	0			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3				
5.				Plot size (radius, or length x width)
6.				% Cover of Wetland Bryophytes
7				(Where applicable)
				% Bare Ground
8	0			Total Cover of Bryophytes
9.				
9 10	0			Hydrophytic
	0 er: 0			Hydrophytic Vegetation Present? Yes • No O

ofile Description: (Describe to Depth	Matrix			ox Featu		,		
inches) Color (m	oist) %	<u>6</u> C	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
			,				·	
pe: C=Concentration. D	=Depletion. RM	=Reduced	Matrix ² Location	: PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
dric Soil Indicators:			Indicators for P	roblema	tic Hydric	Soils ³ :		
Histosol or Histel (A1)		[Alaska Color C	hange (T	A4) ⁴		Alaska Gleyed With	out Hue 5Y or Redder
Histic Epipedon (A2)		[Alaska Alpine s	wales (T	A5)		Underlying Layer	
Hydrogen Sulfide (A4)		[Alaska Redox	Nith 2.5Y	Hue		✓ Other (Explain in R	emarks)
Thick Dark Surface (A	12)		_					
Alaska Gleyed (A13)			³ One indicator of and an appropria				imary indicator of wetla resent	nd hydrology,
Alaska Redox (A14)						must be p		
Alaska Gleyed Pores (A	415)		⁴ Give details of c	olor chan	ige in Remai	rks.		
trictive Layer (if present	t):						Hydric Soil Pres	ent? Yes 🖲 No 🔾
Туре:							Tryunc Son Fres	
Depth (inches):								
marks: Indatedassume hydr	ic soil						1	
Indatedassume hydr	ic soil							
ndatedassume hydr DROLOGY							1	
ndatedassume hydr DROLOGY etland Hydrology Indi	cators:							Indicators (2 or more required)
DROLOGY stland Hydrology Indi	cators:	ent)					Water S	tained Leaves (B9)
DROLOGY stland Hydrology Indi imary Indicators (any Surface Water (A1)	cators: one is sufficie	ent)			5	, 、 ,	Water S	tained Leaves (B9) e Patterns (B10)
DROLOGY Etland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2	cators: one is sufficie	ent)	Sparsely Veg	etated Co	5	, 、 ,	Water S	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3
DROLOGY Etland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3)	cators: one is sufficie	ent)	Sparsely Veg	etated Co s (B15)	oncave Surfa	, 、 ,	Water S Drainag Oxidized Presence	tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3 e of Reduced Iron (C4)
DROLOGY Etland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1)	cators: one is sufficie	ent)	Sparsely Veg Marl Deposit Hydrogen Su	etated Co s (B15) Ilfide Odo	oncave Surfa or (C1)	, 、 ,	Water S Water S Drainag Oxidized Presenc Salt Dep	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5)
DROLOGY Etland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) Sediment Deposits (B	cators: one is sufficie	ent)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	jetated Co s (B15) ilfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water S Drainag Oxidized Presenc Salt Dep Stunted	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1)
DROLOGY TOROLOGY Atland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) Sediment Deposits (B Drift deposits (B3)	cators: one is sufficie	ent)	Sparsely Veg Marl Deposit Hydrogen Su	jetated Co s (B15) ilfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water S Water S Drainag Oxidized Presenc Salt Deg Stunted Geomor	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2)
DROLOGY etland Hydrology Indi rimary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) Sediment Deposits (B Drift deposits (B3) Algal Mat or Crust (B4	cators: one is sufficie	ent)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	jetated Co s (B15) ilfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water S Water S Drainag Oxidized Presend Salt Deg Stunted Geomor Shallow	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3)
DROLOGY Etland Hydrology Indi rimary Indicators (any Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B) Drift deposits (B3)	cators: one is sufficie) 2)	ent)	Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	jetated Co s (B15) ilfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water S Water S Drainag Oxidized Presend Salt Deg Stunted Geomor Shallow Microtog	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2)
DROLOGY etland Hydrology Indi imary Indicators (any Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) Sediment Deposits (B Drift deposits (B3) Algal Mat or Crust (B4 Iron Deposits (B5) Surface Soil Cracks (B	cators: one is sufficie) 2) 6)		Sparsely Veg Marl Deposit Hydrogen Su Dry-Season	jetated Co s (B15) ilfide Odo Water Tal	oncave Surfa or (C1) ble (C2)	, 、 ,	Water S Water S Drainag Oxidized Presend Salt Deg Stunted Geomor Shallow Microtog	tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3 e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
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L1UBH Wetland Functional Class: Lakes and Ponds Wildlife Habitat: Deep Open Water without Islands



Hydric Soil Indicators: Other: inundated, assume hydric soil. Wetland Hydrology Indicators: Surface Water (A1).



	Site: Barrow Environmental Obseratory		rough/City:		- Alaska Region pe Borough Sampling Date: 30-Jul-15
	nt/Owner: UIC				Sampling Point: BEO-34
niootig		I	andform (hill	side terrac	e, hummocks etc.): Relic Lake Basin
Local re	elief (concave, convex, none): concave		Slope: 0.0		
	ion : Northern Alaska		1.279946666		Long.: -156.479955 Datum: WGS84
-	p Unit Name:		1.273340000	0007	NWI classification: PEM1F
	natic/hydrologic conditions on the site typical for this ti	mo of voor?	Vec	• No ()	(If no, explain in Remarks.)
		significantly			ormal Circumstances" present? Yes \odot No \bigcirc
		naturally prol			ded, explain any answers in Remarks.)
				,	
	IARY OF FINDINGS - Attach site map sho	wing samp	pling point	locations	s, transects, important features, etc.
	Irophytic Vegetation Present? Yes ● No ◯		ls t	he Samp	oled Area
-	Iric Soil Present? Yes Ves No		wit	hin a We	etland? Yes \bullet No \bigcirc
-	tland Hydrology Present? Yes • No O				, agitated gull overhead, several jaegers overhead. old
	TATION - Use scientific names of plants. Li	mmediately t	to the north.	-	, agitatea gan overneaa, severar jaegers overneaa. ola
		Absolute	Dominant		Dominance Test worksheet:
Tre 1.	ee Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)
2.					Total Number of Dominant
3.					Species Across All Strata: (B)
4.					Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
5.					Prevalence Index worksheet:
	Total Cover				Total % Cover of: Multiply by:
Sapl	ing/Shrub Stratum 50% of Total Cover:	<u> 0 </u>	f Total Cover:	0	OBL Species 43 x 1 = 43
-					FACW Species $20 \times 2 = 40$
2.					FAC Species 0 x 3 = 0
3. 4.					FACU Species <u>0</u> x 4 = <u>0</u>
4. 5.					UPL Species x 5 =
6.					Column Totals: <u>63</u> (A) <u>83</u> (B)
7.					Prevalence Index = B/A = 1.317
1					
					Hydrophytic Vegetation Indicators:
8.					
8. 9.					\checkmark Prevalence Index is <3.0
8. 9. 10.	Total Cover		of Total Cover:	0	 ✓ Prevalence Index is ≤3.0 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
8. 9. 10. _ He	Total Cover 50% of Total Cover:		of Total Cover:	0 OBL	
8 9 10 _ He	Total Cover	20% o	_		 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
8. 9. 10. _ He 1. _2.	Total Cover <u>erb Stratum</u> Eriophorum angustifolium	20% o		OBL	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
8. 9. 10. 	Total Cover <u>serb Stratum</u> Eriophorum angustifolium Eriophorum russeolum Panunculus pallasii	0 20% o 20 20 11 10		OBL FACW	 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
8. 9. 10. 11. 2. 3. 4.	Total Cover erb Stratum 50% of Total Cover:	20% o 20 20 11 10 2		OBL FACW OBL	 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must
8. 9. 10. 10. 1. 2. 3. 4. 5. 6.	Total Cover 50% of Total Cover: Eriophorum angustifolium Eriophorum russeolum Ranunculus pallasii Carex aquatilis Arctophila fulva	20% o 20 20 11 10 2 0		OBL FACW OBL OBL	 Morphological Adaptations¹ (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. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes
8. 9. 10. 10. 1. 2. 3. 4. 5. 5. 6. 7.	Total Cover 50% of Total Cover:	20% o 20 20 11 10 2 0 0		OBL FACW OBL OBL	 Morphological Adaptations¹ (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. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable)
8. 9. 10. 10. 1. 2. 3. 4. 5. 6. 5. 8.	Total Cover 50% of Total Cover: Eriophorum angustifolium Eriophorum russeolum Ranunculus pallasii Carex aquatilis Arctophila fulva	$ \begin{array}{c} $		OBL FACW OBL OBL	 Morphological Adaptations¹ (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. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>80</u>
8 9 10 11 2 3 4 5 6 7 8 9	Total Cover 50% of Total Cover: Eriophorum angustifolium Eriophorum russeolum Ranunculus pallasii Carex aquatilis Arctophila fulva	$ \begin{array}{c} 0 \\ 20 \\ $		OBL FACW OBL OBL	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. Plot size (radius, or length x width) r=15m % Cover of Wetland Bryophytes (Where applicable) % Bare Ground 80 Total Cover of Bryophytes 15
8 9 10 10 2 3 4 5 6 7 8 9	Total Cover 50% of Total Cover: Eriophorum angustifolium Eriophorum russeolum Ranunculus pallasii Carex aquatilis Arctophila fulva	$ \begin{array}{c} 0 \\ 20 \\ $		OBL FACW OBL OBL	 Morphological Adaptations¹ (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. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>80</u>

Order State Color (model) % Type:1 Loc 2 Teture Remarks 0-13 100	Profile Description: (Describe	Matrix			ox Featı	ires			
Type: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils ² : Histoid of Histoid (A1) Alasia Abias Color Change (TA) ⁴ Histoid of Histoid (A2) Alasia Abias Action: Change (TA) ⁴ Histoid of Histoid (A2) Alasia Abias Action: Change (TA) ⁴ Histoid of Histoid (A1) Alasia Abias Rectox With 2.5Y the Thick Dark Surface (A12) ³ One indicator of hydrohydrix wegtettion: one primary indicator of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A13) ³ One indicator of hydrohydrix wegtettion: one primary indicators of wetland hydrology, and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Reservative Layer (if present): Type: seasonal frost UPDROLOGY Secondary Indicators: Wetland Hydrology Indicators: Finanz Indicators (A14) Secondary Indicators: Water Saline Leaves (B) O and present? Yes: Secondary Indicators (2 or more resourced) Wetland Hydrology Indicators: Secondary Indicators (2 or more resourced) Secondary Indicators: Yes: Secondary Indicators (2 or more resourced) Secondary Indicators:		moist)	% C	olor (moist)	%	Type 1	Loc ²	Texture	Remarks
Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Color Change (TA4) Hydrogen Sulfide (A4) Alaska Alaska Alge swales (TA5) Hydrogen Sulfide (A1) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) Alaska Redox (A14) Alaska Cleved Pores (A15) Alaska Cleved Pores (A15) Alaska Cleved Pores (A15) Alaska Cleved Pores (A15) Geve details of color change in Remarks. Estrictive Layer (if present): Type: seasonal frost Depth (inches): 13 emarks: Primary Indicators: Primary Indicators (any one is sufficient) YPROLOGY Vettand Hydrology Indicators: Primary Indicators (A13) Indicator Size Water (A1) Subrace Water (A1) Indicators (B15) Water Stained Leaves (B9) Subrace Water (A13) Subrace Water (A13) Indicators (B15) Wetland Hydrology Indicators: Primary Indicators (B15) Primary Indicators (B15) Water Table (A2) Subrace Water (A13) Hydrogen Sulfde Odor (C1) Subrace Kitels (B3) Dirik deposits (B3) Other (Explain in Remarks) Subrace Kitels (B1) Hydrogen Sulfde Odor (C1) Subrace Kitels (B2) Dirik deposits (B3) Dirik deposits (B3) Dirik deposits (B3) Dirik deposits (B3) Dirik deposits (0-13		100					Hemic Organics	
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ncludes capillary fringe) Yes in the bepth (inches): 0 ecorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available: emarks:	Depth (inches): 13 marks: YDROLOGY /etland Hydrology Ind 'rimary Indicators (ar ✓ Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Drift deposits (B3) Algal Mat or Crust (E ✓ Iron Deposits (B5) Surface Soil Cracks (ield Observations:	dicators: ny one is suffic N2) B2) B4) (B6) Yes •		Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season N Other (Expla	etated Co s (B15) Ifide Odo Nater Tal in in Rem	oncave Surfa or (C1) ble (C2) harks)		Secondary Secondary Water S Drainag Oxidized ✓ Presence Salt Dep Stunted Geomor ✓ Shallow Microtop	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) f Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4)
ecorded Data (stream gauge, monitor well, aerial photo, previous inspection), if available:	Depth (inches): 13 emarks: YDROLOGY Yetland Hydrology Ind Primary Indicators (ar ✓ Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E ✓ Iron Deposits (B5) Surface Soil Cracks (ieidd Observations: urface Water Present?	dicators: ny one is suffic N2) B2) B4) (B6) Yes •	No O	Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season V Other (Expla	etated Co s (B15) Ifide Odo Nater Tal in in Rem	oncave Surfa or (C1) ble (C2) harks) 3	ice (B8)	Secondary Water S Drainag Oxidized ✓ Presence Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-neu	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
	Depth (inches): 13 emarks: YDROLOGY Vetland Hydrology Ind Primary Indicators (ar Vetland Hydrology Ind Primary Indicators (ar Surface Water (A1) High Water Table (A Surface Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B Surface Soil Cracks (Surface Water Present? Surface Water Present? Water Table Present? Saturation Present?	dicators: hy one is suffic (2) (B2) (B4) (B6) Yes Ye	No 〇 No 〇	Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season N Other (Explain Depth (inch	etated Co s (B15) Ifide Odo Nater Tal in in Rem	oncave Surfa or (C1) ble (C2) harks) 3 1	ice (B8)	Secondary Water S Drainag Oxidized ✓ Presence Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-neu	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
	Depth (inches): 13 emarks: YDROLOGY Yetland Hydrology Integration Primary Indicators (article) Y Surface Water (A1) Y High Water Table (A Y Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E Y Iron Deposits (B5) Surface Soil Cracks (B1) Surface Soil Cracks (B2) Vater Table Present? Water Table Present? Water Table Present? Caturation Present? Catu	dicators: hy one is suffic h2) B2) B4) (B6) Yes	No 〇 No 〇 No 〇	Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season N Other (Expla Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surfa or (C1) ble (C2) harks) 3 1 0	Wetl	Secondary Water S Drainag Oxidized ✓ Presence Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-neu	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
attered nonds visible in imagery not included in this plot surface water described here comprising small shallow pools throughout wetland RS.	Depth (inches): 13 emarks: YDROLOGY Vetland Hydrology Ind Primary Indicators (and Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (Drift deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Surface Soil Cracks (Surface Water Present? Water Table Present? Saturation Present? Satu	dicators: hy one is suffic h2) B2) B4) (B6) Yes	No 〇 No 〇 No 〇	Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season N Other (Expla Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surfa or (C1) ble (C2) harks) 3 1 0	Wetl	Secondary Water S Drainag Oxidized ✓ Presence Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-neu	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) d Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) tral Test (D5)
on floc. C4biogenic sheen. D3seasonal frost ec 70 temp 43	Depth (inches): 13 Pemarks: YDROLOGY Vetland Hydrology Ind Primary Indicators (ar Y Surface Water (A1) ✓ High Water Table (A ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (E ✓ Iron Deposits (B5) Surface Soil Cracks (ield Observations: urface Water Present? vater Table Present? vater Table Present? ecorded Data (stream emarks:	dicators: ny one is suffic A2) (B2) B4) (B6) Yes Yes Yes n gauge, moni	No O No O No O tor well, aer	Sparsely Veg Marl Deposit: Hydrogen Su Dry-Season N Other (Expla) Depth (inch Depth (inch Depth (inch Tial photo, previo	etated Co s (B15) Ifide Odo Water Tal in in Rem nes): nes): nes): pus inspo	oncave Surfa or (C1) ble (C2) narks) 3 1 0 ection), if a	Wetl	Secondary Water S Drainag Oxidized ✓ Presenc Salt Dep Stunted Geomor ✓ Shallow Microtop ✓ FAC-neu	Indicators (2 or more required) tained Leaves (B9) e Patterns (B10) I Rhizospheres along Living Roots (C3) e of Reduced Iron (C4) posits (C5) or Stressed Plants (D1) phic Position (D2) Aquitard (D3) pographic Relief (D4) ttral Test (D5) essent? Yes No

PEM1F

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Surface Water (A1), High Water Table (A2), Saturation (A3), Iron Deposits (B5).



	•		prough/City:		pe Borough Sampling Date:	30-Jul-15
pplicant/Owner: UIC					Sampling Point:	BEO-35
vestigator(s): SLI, EKJ		L	andform (hill	side, terrac	e, hummocks etc.): Flat	
ocal relief (concave, convex, none):	concave	:	Slope: 0.0	%/ 0.0	elevation: 25	
ubregion : Northern Alaska		Lat.: 7	1.282331666	6667	Long.: -156.478945 D	atum: WGS84
oil Map Unit Name:		_			NWI classification: PEM1	F
re climatic/hydrologic conditions on	the site typical for this ti	me of year?	Yes	• No ()	(If no, explain in Remarks.)	
Are Vegetation, Soil	•••	significantly		Are "N	lormal Circumstances" present? Yes	• No ()
Are Vegetation, Soil		naturally pro			eded, explain any answers in Remarks.)	
		wing com	nling noint			
		wing sam	ping point	locations	s, transects, important features,	elc.
Hydrophytic Vegetation Present?			ls t	he Sam	pled Area	
Hydric Soil Present?	Yes 🔍 No 🔾		wit	hin a We	etland? Yes • No	
Wetland Hydrology Present?	Yes 🔍 No 🔾					
flocks of king eiders ove	erhead. numerous dunlir	n in commur	nity.		trails through sedges to small ponds in	basiris. two large
EGETATION - Use scientific	names of plants. Li	ist all spec	cies in the	plot.		
		Absolute	Dominant		Dominance Test worksheet:	
Tree Stratum		% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC:	2 (A)
÷					Total Number of Dominant	<u> </u>
2. 3.					Species Across All Strata:	<u>2</u> (B)
1					Percent of dominant Species	
					That Are OBL, FACW, or FAC:	100.0% (A/B)
5.	Total Cover	: 0			Prevalence Index worksheet:	
	Total Cover 50% of Total Cover:		of Total Cover:		Prevalence Index worksheet: Total % Cover of: Multiply	by:
Sapling/Shrub Stratum	50% of Total Cover:	0 20% (of Total Cover:	0	Total % Cover of: Multiply OBL Species <u>60</u> x 1 =	by: 60
Sapling/Shrub Stratum	50% of Total Cover:	<u> </u>	of Total Cover:	0	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =	
Sapling/Shrub Stratum 1. 2.	50% of Total Cover:	20% d	of Total Cover:	0	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =	0 0
Sapling/Shrub Stratum 1. 2. 3.	50% of Total Cover:	20% (of Total Cover:	0 	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =FACU Species0x 4 =	60 0 0 0
Sapling/Shrub Stratum 1. 2. 3. 4.	50% of Total Cover:	_0 20% d	of Total Cover:	0 	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =	0 0
Sapling/Shrub Stratum 1. 2. 3. 4. 5.	50% of Total Cover:	_0 20% (of Total Cover:	0	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =FACU Species0x 4 =	60 0 0 0
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6.	50% of Total Cover:	0 20% (of Total Cover:	0 	Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)	60 0 0 0 0
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6.	50% of Total Cover:	0 20% (of Total Cover:	0 	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =FACU Species0x 4 =UPL Species0x 5 =Column Totals:60(A)Prevalence Index = B/A =	60 0 0 0 0 60 (B)
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7.	50% of Total Cover:		of Total Cover:	0 	Total % Cover of:MultiplyOBL Species60x 1 =FACW Species0x 2 =FAC Species0x 3 =FACU Species0x 4 =UPL Species0x 5 =Column Totals:60(A)Prevalence Index = B/A =	60 0 0 0 0 60 (B)
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8.	50% of Total Cover:		of Total Cover:	 	Total % Cover of: Multiply OBL Species 60 x 1 = FACW Species 0 x 2 = FAC Species 0 x 3 = FACU Species 0 x 4 = UPL Species 0 x 5 = Column Totals: 60 (A) Prevalence Index = B/A =	60 0 0 0 0 60 (B)
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9.	50% of Total Cover:	0 20% (Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = $-$ Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0	60 0 0 0 60 (B) 1.000
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9.	50% of Total Cover:	0 20% (Total % Cover of: Multiply OBL Species 60 x 1 = FACW Species 0 x 2 = FAC Species 0 x 3 = FACU Species 0 x 4 = UPL Species 0 x 5 = Column Totals: 60 (A) Prevalence Index = B/A =	60 0 0 0 60 (B) 1.000
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	50% of Total Cover:	0 20% (Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide	60 0 0 0 60 (B) 1.000
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	50% of Total Cover:	0 20% 0 	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 1 Indicators of hydric soil and wetland hydr	60 0 0 0 60 (B) 1.000 (Explain) rology must
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Herb Stratum 1. Carex aquatilis 2. Eriophorum angustifolium	50% of Total Cover:	0 20% 0 	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \blacksquare \checkmark Dominance Test is > 50% \checkmark Prevalence Index is <3.0	60 0 0 0 60 (B) 1.000 (Explain) rology must
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Herb Stratum 1. Carex aquatilis	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 1 Indicators of hydric soil and wetland hydr	60 0 0 0 60 (B) 1.000 (Explain) rology must
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Herb Stratum 1. Carex aquatilis 2. 3.	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 1 Indicators of hydric soil and wetland hydr	60 0 0 0 60 (B) 1.000 (Explain) rology must
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Herb Stratum 1. Carex aquatilis 2. 3. 4.	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of: Multiply OBL Species <u>60</u> x 1 = FACW Species <u>0</u> x 2 = FAC Species <u>0</u> x 3 = FACU Species <u>0</u> x 4 = UPL Species <u>0</u> x 5 = Column Totals: <u>60</u> (A) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: ✓ Dominance Test is > 50% ✓ Prevalence Index is ≤ 3.0 Morphological Adaptations ¹ (Provide Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ Indicators of hydric soil and wetland hydr be present, unless disturbed or problemate Plot size (radius, or length x width) % Cover of Wetland Bryophytes	60 0 0 0 60 (B) 1.000 (Explain) rology must ic.
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Lerb Stratum 1. Carex aquatilis 2. Eriophorum angustifolium 3. 4. 5. 6. 7.	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A =Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ Indicators of hydric soil and wetland hydric be present, unless disturbed or problematePlot size (radius, or length x width)% Cover of Wetland Bryophytes (Where applicable)	60 0 0 0 60 60 (B) 1.000 supporting data in (Explain) rology must ic.
Sapling/Shrub Stratum 1.	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators:✓Dominance Test is > 50%✓Prevalence Index is ≤ 3.0 \blacksquare Morphological Adaptations ¹ (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 ¹ Indicators of hydric soil and wetland hydr be present, unless disturbed or problematPlot size (radius, or length x width)% Cover of Wetland Bryophytes (Where applicable)% Bare Ground	60 0 0 0 60 60 (B) 1.000 supporting data in (Explain) rology must ic. <u>r=5m</u> 99
Sapling/Shrub Stratum 1.	50% of Total Cover:		of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators: \checkmark \checkmark Dominance Test is > 50% \checkmark \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 Indicators of hydric soil and wetland hydride present, unless disturbed or problemation the present, unless disturbed or problemation the present (Where applicable)% Bare GroundTotal Cover of Bryophytes	60 0 0 0 60 60 (B) 1.000 supporting data in (Explain) rology must ic.
Sapling/Shrub Stratum 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Herb Stratum 1. Carex aquatilis 2. Eriophorum angustifolium 3. 4. 5. 6. 7. 8.	50% of Total Cover:	0 20% o	of Total Cover:		Total % Cover of:MultiplyOBL Species 60 x 1 =FACW Species 0 x 2 =FAC Species 0 x 3 =FACU Species 0 x 4 =UPL Species 0 x 5 =Column Totals: 60 (A)Prevalence Index = B/A = \blacksquare Hydrophytic Vegetation Indicators:✓Dominance Test is > 50%✓Prevalence Index is ≤ 3.0 \blacksquare Morphological Adaptations ¹ (Provide Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 ¹ Indicators of hydric soil and wetland hydr be present, unless disturbed or problematPlot size (radius, or length x width)% Cover of Wetland Bryophytes (Where applicable)% Bare Ground	60 0 0 0 60 60 (B) 1.000 supporting data in (Explain) rology must ic. <u>r=5m</u> 99

WETLAND DETERMINATION DATA FORM - Alaska Region

Profile Descripti		e depth need atrix	ed to docume	ent the indicator or cor	nfirm the ab: Iox Featu		cators)			
Depth (inches)	Color (mois		%	Color (moist)	%	Type ¹	Loc 2	Texture	Rem	arks
0-2			100			Туре	LUC	Fibric Organics		
2-8							10	Hemic Organics		
			100		-			·		
8-13	10YR	2/2	100					Silt Loam		
								·		
							<u>.</u>			
		epletion. R	M=Reduced	Matrix ² Location				annel. M=Matrix		
Hydric Soil	Indicators:			Indicators for F			Soils ³ :			
Histosol d	or Histel (A1)			Alaska Color C	Change (TA	A4) ⁴		Alaska Gleyed Without	Hue 5Y or Redder	
Histic Epi	pedon (A2)			Alaska Alpine	swales (TA	45)		Underlying Layer		
Hydroger	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rema	arks)	
Thick Date	rk Surface (A12)									
🗌 Alaska Gl	eyed (A13)							imary indicator of wetland I	hydrology,	
🗌 Alaska Re	edox (A14)			and an appropria	ite landsca	ipe position	i must be p	present.		
🗌 Alaska Gl	eyed Pores (A15)		⁴ Give details of o	color chan	ge in Rema	ırks.			
Restrictive Lay	ver (if present):								-	\sim
Type: se	asonal frost							Hydric Soil Present	:? Yes 🖲 N	lo ()
Depth (inc	ches): 13									
Remarks:										
HYDROLC										
-	Irology Indicat								licators (2 or more	e required)
	icators (any or	ne is suffic	ient)					Water Stain	ed Leaves (B9)	
Surface V				Inundation V	isible on <i>l</i>	Aerial Imag	jery (B7)	Drainage Pa	atterns (B10)	
🗹 High Wa	ter Table (A2)			Sparsely Ve	getated Co	ncave Surf	ace (B8)	Oxidized Rh	izospheres along Liv	ring Roots (C3)
Saturatio	on (A3)			Marl Deposi	ts (B15)			Presence of	Reduced Iron (C4)	
Water M	arks (B1)			🗌 Hydrogen Si	ulfide Odo	r (C1)		Salt Deposit	ts (C5)	
Sedimen	t Deposits (B2)			Dry-Season	Water Tab	ole (C2)		Stunted or S	Stressed Plants (D1)	
🗌 Drift dep	osits (B3)			Other (Expla	ain in Rem	arks)		Geomorphic	Position (D2)	
🗌 Algal Ma	t or Crust (B4)							🗹 Shallow Aqu	uitard (D3)	
Iron Dep	osits (B5)							Microtopogr	raphic Relief (D4)	
Surface S	Soil Cracks (B6)							FAC-neutral	Test (D5)	
Field Observ	ations:	-	-							
Surface Wate	r Present?	Yes 💿	No 〇	Depth (inc	hes):	4	7			
Water Table F	Present?	Yes 🖲	No 〇	Depth (inc	hes)	0	Wetl	land Hydrology Prese	nt?Yes 🖲	No O
Saturation Pre	esent?	Yes 🖲								
(includes capi	llary fringe)		No O	Depth (inc		0				
Recorded Da	ita (stream gai	uge, moni	tor well, a	erial photo, previ	ous inspe	ection), if	available:			
Remarks:	r Ain door in -	odace 4-	onor in an	all ponde D2 -	and the second for	oct				
temp 55	i Hin deep in s	euges, de	eper in sm	all ponds. D3se	asonal fi	USL				
ec 410										

PEM1F

Wetland Functional Class: Wet Graminoid Meadow and Shallow Open Water Complex Wildlife Habitat: Deep Polygon Complex



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: Surface Water (A1), High Water Table (A2), Saturation (A3)



ite: Barrow Environmental Obseratory		rough/City:		- Alaska Region pe Borough Sampling Date: 30-Jul-15
:/Owner: UIC				Sampling Point: BEO-36
tor(s): SLI, EKJ	Li	andform (hills	side. terrac	e, hummocks etc.): Flat
ief (concave, convex, none): concave		lope: 0.0		
		-		Long.: -156.480498333333 Datum: WGS84
	· ·			NWI classification: PEM1B
-	me of vear?	Yes		(If no, explain in Remarks.)
getation, Soil, or Hydrology	significantly	disturbed?	Are "N	lormal Circumstances" present? Yes ● No ○ eded, explain any answers in Remarks.)
ARY OF FINDINGS - Attach site man sho	<i>w</i> ing samr	lina point	locations	s transects important features etc
	ung camp			·
		ls t	he Samp	
		wit	hin a We	etland? Yes $ullet$ No $igodoldoldoldoldoldoldoldoldoldoldoldoldol$
	t sedae tund	ra.		
ATION - Use scientific names of plants. L	st all spec	ies in the	olot.	
				Dominance Test worksheet:
Stratum	% Cover	Species?	Status	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
				That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant
				Species Across All Strata: <u>2</u> (B)
				Percent of dominant Species
				That Are OBL, FACW, or FAC: 100.0% (A/B)
Total Cover	0			Prevalence Index worksheet:
g/Shrub Stratum50% of Total Cover:	0 20% o	f Total Cover:	0	Total % Cover of: Multiply by:
				OBL Species <u>10</u> \times 1 = <u>10</u>
				FACW Species 5.2 $x 2 =$ 10.4 FAC Species 43.1 $x 3 =$ 129.3
				FAC Species 43.1 x 3 = 129.3 FACU Species 0 x 4 = 0
				$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $
				Column Totals: <u>58.3</u> (A) <u>149.7</u> (B)
				Prevalence Index = $B/A = 2.568$
				Hydrophytic Vegetation Indicators:
				✓ Dominance Test is > 50%
Total Cover	• 0			✓ Prevalence Index is \leq 3.0
		f Total Cover:	0	Morphological Adaptations ¹ (Provide supporting data in
b Stratum50% of Total Cover:	0			Remarks or on a separate sheet)
<u>b Stratum</u> 50% of Total Cover:	25	\checkmark	FAC	Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
b Stratum		✓ ✓	FAC FAC	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must
uzula nivalis	25 15 10			Problematic Hydrophytic Vegetation ¹ (Explain)
uzula nivalis uzula confusa Carex aquatilis Petasites frigidus	25 15 10 5		FAC OBL FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must
Luzula nivalis Luzula confusa Carex aquatilis Petasites frigidus Poa arctica	25 15 10 5 3		FAC OBL FACW FAC	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15</u>
Distratum Luzula nivalis Luzula confusa Carex aquatilis Petasites frigidus Poa arctica Baxifraga cernua	25 15 10 5 3 0.1		FAC OBL FACW FAC FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15</u> % Cover of Wetland Bryophytes
b Stratum Luzula nivalis Luzula confusa Carex aquatilis Petasites frigidus Poa arctica Saxifraga cernua Saxifraga foliolosa	25 15 10 5 3 0.1 0.1		FAC OBL FACW FAC FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15</u> % Cover of Wetland Bryophytes (Where applicable)
b Stratum	25 15 10 5 3 0.1 0.1 0.1		FAC OBL FACW FAC FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>10</u>
b Stratum	25 15 10 5 3 0.1 0.1		FAC OBL FACW FAC FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) r=15 % Cover of Wetland Bryophytes (Where applicable) % Bare Ground 10 Total Cover of Bryophytes 20
b Stratum	25 15 10 5 3 0.1 0.1 0.1 0 0		FAC OBL FACW FAC FACW	 Problematic Hydrophytic Vegetation ¹(Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>10</u>
	getation , Soil , or Hydrology in the stress of plants. Line ARY OF FINDINGS - Attach site map show ophytic Vegetation Present? Yes No ophytic Vegetation Present? Yes No ic Soil Present? Yes No and Hydrology Present? Yes No In the stress of plants. Line In the stress of plants. Line arks: high center polygon top. troughs are pem1e week Total Cover article Stratum 50% of Total Cover: In the stress of plants. Line	Unit Name:	Unit Name:	Unit Name:

	•	atrix		nt the indicator or conf Red	ox Featu				
Depth (inches)	Color (moist	:)	%	Color (moist)	%	Type 1	Loc 2	Texture	Remarks
0-2			100					Hemic Organics	
2-3	7.5YR 2	2.5/3	100					Silt Loam	
		· · · · · ·						·	
3-8			100					Hemic Organics	
					8				
17 0.0				<u> </u>	<u> </u>			<u></u>	
		epletion. R	M=Reduced	Matrix ² Location:				annel. M=Matrix	
Hydric Soil							Solis" :		
	or Histel (A1)			Alaska Color Ch		-		Alaska Gleyed Without	Hue 5Y or Redder
	ipedon (A2)			Alaska Alpine s	•	,		Underlying Layer	
	n Sulfide (A4)			Alaska Redox V	with 2.5Y	Hue		Other (Explain in Rema	rksj
	rk Surface (A12)			3 One indicator of	hydrone	vtic vocatet	ion one r	imany indicator of watter d	wdrology
	leyed (A13)			and an appropriat				imary indicator of wetland h present.	iyai olugy,
	edox (A14)								
🔝 Alaska G	leyed Pores (A15))		⁴ Give details of c	olor chan	ige in Rema	rks.		
Restrictive Lay	yer (if present):								
	easonal frost							Hydric Soil Present	? Yes 🖲 No 🔾
Depth (ind	ches): 8								
Remarks:									
1									
	DGY drology Indicat	ors:							icators (2 or more required)
Wetland Hyd	drology Indicat licators (any on		ient)					Water Stain	ed Leaves (B9)
Wetland Hyd Primary Ind	drology Indicat licators (any on Water (A1)		ient)	Inundation V	isible on	Aerial Imag	ery (B7)		ed Leaves (B9)
Wetland Hyd Primary Ind Surface Image: Surface Image: High Wate	drology Indicat licators (any on Water (A1) iter Table (A2)		ient)	Sparsely Veg	etated Co	-		Water Stain	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3)
Wetland Hye Primary Ind Surface ✓ High Wa ✓ Saturation	drology Indicat licators (any on Water (A1) iter Table (A2) on (A3)		cient)	Sparsely Veg	etated Co s (B15)	oncave Surf		Water Stain Drainage Pa Oxidized Rh Presence of	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4)
Wetland Hyd Primary Ind Surface Image: Surface	drology Indicat licators (any on Water (A1) Iter Table (A2) on (A3) larks (B1)		ient)	Sparsely Veg Marl Deposits Hydrogen Su	etated Co s (B15) Ifide Odo	oncave Surf or (C1)		Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturation Water M Sediment	drology Indicat licators (any on Water (A1) uter Table (A2) on (A3) larks (B1) ut Deposits (B2)		ient)	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V	etated Co s (B15) lfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stain Drainage Pa Oxidized Rh Oxidized Rh Presence of Salt Deposit Stunted or S	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatic Water M Sedimen Drift dep	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) tt Deposits (B2) posits (B3)		ient)	Sparsely Veg	etated Co s (B15) lfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2)
Wetland Hyd Primary Ind Surface ✓	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) tt Deposits (B2) posits (B3) tt or Crust (B4)		ient)	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V	etated Co s (B15) lfide Odo Water Tal	oncave Surf or (C1) ble (C2)		□ Water Stain □ Drainage Pa □ Oxidized Rh □ Presence of □ Salt Deposit □ Stunted or S □ Geomorphic ☑ Shallow Aqu	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2) itard (D3)
Wetland Hyg Primary Ind Surface ✓ High Wa ✓ Saturation Water M Sediment Drift dep Algal Ma Iron Dep	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) tt Deposits (B2) posits (B3) at or Crust (B4) posits (B5)		ient)	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V	etated Co s (B15) lfide Odo Water Tal	oncave Surf or (C1) ble (C2)		Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic Shallow Aqu Microtopogr	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4)
Wetland Hyd Primary Ind Surface ✓ High Water ✓ Saturation Water M Sedimen Drift dep Algal Materia Iron Dep Surface	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6)		ient)	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V	etated Co s (B15) lfide Odo Water Tal	oncave Surf or (C1) ble (C2)		□ Water Stain □ Drainage Pa □ Oxidized Rh □ Presence of □ Salt Deposit □ Stunted or S □ Geomorphic ☑ Shallow Aqu	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4)
Wetland Hyg Primary Ind Surface ✓ High Wa ✓ Saturation Water M Sedimen Drift dep Algal Ma Iron Dep Surface	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) posits (B3) ht or Crust (B4) posits (B5) Soil Cracks (B6) vations:	e is suffic		Sparsely Veg	etated Co s (B15) Ifide Odo Water Tal in in Rem	oncave Surf or (C1) ble (C2)		Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic Shallow Aqu Microtopogr	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4)
Wetland Hyd Primary Ind Surface ✓ High Wat ✓ Saturation Water M Sedimen Drift dep Algal Mat Iron Dep Surface	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) posits (B3) ht or Crust (B4) posits (B5) Soil Cracks (B6) vations:	ie is suffic	No 💿	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V	etated Co s (B15) Ifide Odo Water Tal in in Rem	oncave Surf or (C1) ble (C2)		Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic Shallow Aqu Microtopogr	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) Stressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4)
Wetland Hye Primary Ind Surface ✓ High Wa ✓ Saturation ✓ Water M ○ Sedimen □ Drift dep □ Algal Ma □ Iron Dep ○ Surface Field Observ Surface Water Water Table F	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) vations: rr Present? Present?	e is suffic		Sparsely Veg	etated Co s (B15) Ifide Odo Nater Tal in in Rem	oncave Surf or (C1) ble (C2)	ace (B8)	Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic Shallow Aqu Microtopogr	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Primary Ind Surface High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Surface Surface Wate	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) posits (B3) ht or Crust (B4) posits (B5) Soil Cracks (B6) vations: rr Present? Present?	ie is suffic	No 💿	Sparsely Veg	etated Co s (B15) Ifide Odo Nater Tal in in Rem	oncave Surf or (C1) ble (C2) harks)	ace (B8)	Water Stain Drainage Pa Oxidized Rh Presence of Salt Deposit Stunted or S Geomorphic Value Microtopogr FAC-neutral	ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Drift dep Algal Ma Iron Dep Surface Water Water Table F Saturation Pro (includes capitor)	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) Soil Cracks (B6) vations: rr Present? Present? esent? esent? illary fringe)	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season N Other (Explain Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table F Saturation Pro (includes capi Recorded Da	drology Indicat licators (any on Water (A1) ther Table (A2) on (A3) larks (B1) ht Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) Soil Cracks (B6) vations: rr Present? Present? esent? esent? illary fringe)	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table F Saturation Pro (includes capi Recorded Da Remarks:	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) bosits (B3) at or Crust (B4) bosits (B5) Soil Cracks (B6) vations: ar Present? Present? esent? illary fringe) at a (stream gau	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table F Saturation Pro (includes capi Recorded Da	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) bosits (B3) at or Crust (B4) bosits (B5) Soil Cracks (B6) vations: ar Present? Present? esent? illary fringe) at a (stream gau	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table F Saturation Pro (includes capi Recorded Da Remarks:	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) bosits (B3) at or Crust (B4) bosits (B5) Soil Cracks (B6) vations: ar Present? Present? esent? illary fringe) at a (stream gau	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface ✓ High Wa ✓ Saturatio Water M Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table P Saturation Pro (includes capi Recorded Da Remarks:	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) bosits (B3) at or Crust (B4) bosits (B5) Soil Cracks (B6) vations: ar Present? Present? esent? illary fringe) at a (stream gau	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)
Wetland Hyd Primary Ind Surface High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Surface Field Observ Surface Water Water Table P Saturation Pro (includes capi Recorded Da Remarks:	drology Indicat licators (any on Water (A1) tter Table (A2) on (A3) larks (B1) at Deposits (B2) bosits (B3) at or Crust (B4) bosits (B5) Soil Cracks (B6) vations: ar Present? Present? esent? illary fringe) at a (stream gau	Yes ○ Yes ● Yes ●	No ● No ○ No ○	Sparsely Veg Marl Deposits Hydrogen Su Dry-Season V Other (Explain Depth (inch Depth (inch Depth (inch	etated Co s (B15) Ifide Odo Water Tal in in Rem nes):	oncave Surf or (C1) ble (C2) harks) 7 0	ace (B8)		ed Leaves (B9) tterns (B10) izospheres along Living Roots (C3) Reduced Iron (C4) s (C5) 5tressed Plants (D1) Position (D2) itard (D3) aphic Relief (D4) Test (D5)

Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



Project/Site: Barrow Environmental Obseratory	Borough/City:		- Alaska Region pe Borough Sampling Date: 31-Jul-15
Applicant/Owner: UIC			Sampling Point: BEO-37
nvestigator(s): SLI, EKJ	Landform (h	nillside, terrac	e, hummocks etc.): Flat
ocal relief (concave, convex, none): concave	Slope: 0.	0 % / 0.0	elevation: 25
ubregion : Northern Alaska	Lat.: 71.264505		Long.: -156.465003333333 Datum: WGS8
bil Map Unit Name:			NWI classification: PEM1F
re climatic/hydrologic conditions on the site typical for this t	me of vear? Ye	s 🖲 No 🔿	(If no, explain in Remarks.)
	significantly disturbed?	Are "N	ormal Circumstances" present? Yes No
	naturally problematic?		ded, explain any answers in Remarks.)
UMMARY OF FINDINGS - Attach site map sho	wina samplina poir	nt locations	transects important features etc
Hydrophytic Vegetation Present? Yes • No			
	Is	the Sam	
Hydric Soil Present? Yes ● No ○ Wetland Hydrology Present? Yes ● No ○	w	vithin a We	etland? Yes \bullet No \bigcirc
Remarks: low center polygonal tundra, characterizing bas	in DEM1E wet sedae h	acine with DF	M1B mesic sedae rims
	-		
EGETATION - Use scientific names of plants. L		•	Densing a factor dela del
Tree Stratum	Absolute Dominant <u>% Cover</u> Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species
1	🗆		That are OBL, FACW, or FAC: (A)
2			Total Number of Dominant Species Across All Strata: 1 (B)
3.			Percent of dominant Species
4.			That Are OBL, FACW, or FAC: <u>100.0%</u> (A/
5.	Ш		Prevalence Index worksheet:
Total Cover			
		ar: o	Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover:	20% of Total Cove	er: <u>0</u>	
Sapling/Shrub Stratum 50% of Total Cover: 1.	_0 20% of Total Cove	er: <u>0</u>	Total % Cover of: Multiply by:
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er: 	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x 1 = 35$ FACW Species5 $x 2 = 10$ FAC Species0 $x 3 = 0$
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:0	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125
Sapling/Shrub Stratum 50% of Total Cover:	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:40(A)45
Sapling/Shrub Stratum 50% of Total Cover:	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x \ 1 =$ 35FACW Species5 $x \ 2 =$ 10FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50%
Sapling/Shrub Stratum 50% of Total Cover:	20% of Total Cove		Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove		Total % Cover of:Multiply by:OBL Species35 $x 1 =$ 35FACW Species5 $x 2 =$ 10FAC Species0 $x 3 =$ 0FACU Species0 $x 4 =$ 0UPL Species0 $x 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data
Sapling/Shrub Stratum 50% of Total Cover: 1.	20% of Total Cove	er:	Total % Cover of:Multiply by:OBL Species35 $x \ 1 =$ 35FACW Species5 $x \ 2 =$ 10FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation $^1(Explain)$ 1 Indicators of hydric soil and wetland hydrology must
Sapling/Shrub Stratum 50% of Total Cover: 1.	_0 20% of Total Cove 	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35 $x \ 1 =$ 35FACW Species5 $x \ 2 =$ 10FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation $^1(Explain)$
Sapling/Shrub Stratum 50% of Total Cover: 1.	_0 20% of Total Cove 	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35 $x \ 1 =$ 35FACW Species5 $x \ 2 =$ 10FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation $^1(Explain)$ 1 Indicators of hydric soil and wetland hydrology must
Sapling/Shrub Stratum 50% of Total Cover: 1.	_0 20% of Total Cove 	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35 $x \ 1 =$ 35FACW Species5 $x \ 2 =$ 10FAC Species0 $x \ 3 =$ 0FACU Species0 $x \ 4 =$ 0UPL Species0 $x \ 5 =$ 0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation $^1(Explain)$ 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=5m$
Sapling/Shrub Stratum 50% of Total Cover: 1.	_020% of Total Cove 	er: <u>0</u> OBL	Total % Cover of: Multiply by: OBL Species 35 x 1 = 35 FACW Species 5 x 2 = 10 FAC Species 0 x 3 = 0 FACU Species 0 x 4 = 0 UPL Species 0 x 5 = 0 Column Totals: 40 (A) 45 (B Prevalence Index = B/A = 1.125 Hydrophytic Vegetation Indicators: \checkmark \bigcirc Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \bigcirc Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet) \bigcirc Problematic Hydrophytic Vegetation ¹ (Explain) 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. r=5m % Cover of Wetland Bryophytes
Sapling/Shrub Stratum 50% of Total Cover: 1.	$\begin{array}{c c} 0 & 20\% \text{ of Total Cove} \\ \hline \\ 0 & & \\ \hline \\ 0 &$	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35x 1 =35FACW Species5x 2 =10FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width)r=5m% Cover of Wetland Bryophytes
Sapling/Shrub Stratum 50% of Total Cover: 1.	$\begin{array}{c c} 0 & 20\% \text{ of Total Cove} \\ \hline \\ 0 & & \\ \hline \end{array}$	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35x 1 =35FACW Species5x 2 =10FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width)r=5m% Cover of Wetland Bryophytes
Sapling/Shrub Stratum 50% of Total Cover: 1.	$\begin{array}{c c} 0 & 20\% \text{ of Total Cove} \\ \hline \\ 0 & & \\ \hline \end{array}$	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35x 1 =35FACW Species5x 2 =10FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width)r=5m% Cover of Wetland Bryophytes(Where applicable)% Bare Ground90Total Cover of Bryophytes5
Sapling/Shrub Stratum 50% of Total Cover: 1.	_0 20% of Total Cove 	er: <u>0</u> OBL	Total % Cover of:Multiply by:OBL Species35x 1 =35FACW Species5x 2 =10FAC Species0x 3 =0FACU Species0x 4 =0UPL Species0x 5 =0Column Totals:40(A)45Prevalence Index = B/A =1.125Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width)r=5m% Cover of Wetland Bryophytes

-	•	ne depth nee atrix	ded to docum	ent the indicator or con Rec	nfirm the ab		ators)		
Depth (inches)	Color (mois	it)	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks
0-3			100					Fibric Organics	
3-5			100					Hemic Organics	-
5-6		3/3	100					Silt Loam	_
6-16			100					Hemic Organics	
0-10			100						with mineral inclusions
-					-		-		-
¹ Type: C=Co	ncentration. D=I	Depletion. I	RM=Reduce	d Matrix ² Location	n: PL=Por	e Lining. RC	=Root Cha	annel. M=Matrix	
Hydric Soil	Indicators:			Indicators for I	Problema	tic Hydric	Soils ³ :		
Histosol	or Histel (A1)			Alaska Color C	hange (T	44) ⁴		Alaska Gleyed Withou	t Hue 5Y or Redder
Histic Ep	. ,			Alaska Alpine		-		Underlying Layer	The ST of Redder
	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rem	narks)
	ark Surface (A12))						- •	
	ileyed (A13)							imary indicator of wetland	hydrology,
	edox (A14)			and an appropria	ate landsca	ape position	must be p	resent.	
	ileyed Pores (A1	5)		⁴ Give details of	color chan	ge in Rema	rks.		
						-		T	
Restrictive La	yer (if present):								·•
Type: s	easonal frost							Hydric Soil Presen	t? Yes 🖲 No 🔾
Depth (in	ches): 16								
HYDROLO									
-	drology Indica								dicators (2 or more required)
	dicators (any o	ne is suffi	cient)						ned Leaves (B9)
	Water (A1)			Inundation		5	, , ,	_	Patterns (B10)
	ater Table (A2)			Sparsely Ve	-	oncave Surfa	ace (B8)		hizospheres along Living Roots (C3)
Saturati	. ,			Marl Deposi	• •	(=.)			f Reduced Iron (C4)
	1arks (B1)			Hydrogen S				Salt Depos	()
	nt Deposits (B2)			Dry-Season					Stressed Plants (D1)
	posits (B3)			Other (Expla	ain in Rem	arks)		Geomorphi Shallow Aq	ic Position (D2)
Iron De	at or Crust (B4)								juitard (D3) jraphic Relief (D4)
	Soil Cracks (B6)							FAC-neutra	
	. ,								
Field Obser Surface Wate		$_{Yes}$ O	No 🖲	Depth (inc	hec).		ור		
Water Table		Yes •					」 	and theder to 🗢	
Saturation Pr			_	Depth (inc	hes):	1	Wet	and Hydrology Pres	ent? Yes 🖲 No 🔾
(includes cap		Yes 🖲	No 〇	Depth (inc	hes):	0			
Recorded Da	ata (stream ga	uge, mon	itor well, a	aerial photo, previ	ous inspe	ection), if a	available:		
temp 41 ec			it, but iror	floc and bare gro	ound sug	gest that b	asins are	usually flooded.	

Wetland Functional Class: Seasonally Flooded-Saturated Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Iron Deposits (B5).



PEM1F

	/Site: Barrow Environmental Obseratory				- Alaska Region De Borough Sampling Date: 31-Jul-15			
Applica	ant/Owner: UIC				Sampling Point: BEO-38			
•••	gator(s): SLI, EKJ	L	_andform (hill	side, terrac	e, hummocks etc.): Flat			
	elief (concave, convex, none): concave		Slope: 0.0					
Subreg	jion : Northern Alaska	Lat.: 7	1.266681666	6667	Long.: -156.460483333333 Datum: WGS84			
oil Ma	ip Unit Name:				NWI classification: PEM1B			
re clir	natic/hydrologic conditions on the site typical for this ti	me of year?	y Yes	• No ()	(If no, explain in Remarks.)			
		significantly		Are "N	ormal Circumstances" present? Yes 🔍 No 🔾			
Are V	/egetation □ , Soil 🗹 , or Hydrology □ ।	naturally pro	oblematic?	(If nee	ded, explain any answers in Remarks.)			
	MARY OF FINDINGS - Attach site map show	wing sam	nlina noint	locations	transects important features etc			
	drophytic Vegetation Present? Yes \bigcirc No \bigcirc				·			
-	dric Soil Present? Yes No	-	ne Sampled Area					
	etland Hydrology Present? Yes No		within a Wetland? Yes \odot No \bigcirc					
		enter nolva	onal tundra	mix of DEI	M1E and PEM1B, suggest PEM1B for community as a wi			
'EGE	ETATION - Use scientific names of plants. Li	st all spe		olot. Indicator	Dominance Test worksheet:			
Tr	ree Stratum	% Cover	Species?	Status	Number of Dominant Species			
1.					That are OBL, FACW, or FAC: (A)			
2.					Total Number of Dominant Species Across All Strata:4(B)			
3.					Percent of dominant Species			
4. 5.					That Are OBL, FACW, or FAC: (A/B			
5.	Total Cover	. 0			Prevalence Index worksheet:			
	Total Cover		of Total Cover:	0	Prevalence Index worksheet: Total % Cover of: Multiply by:			
Sap	ling/Shrub Stratum 50% of Total Cover:	0 20%			Total % Cover of:Multiply by:OBL Species 45 $x 1 = 45$			
Sap 1.	Salix pulchra 50% of Total Cover:			0 FACW FAC	Total % Cover of:Multiply by:OBL Species 45 $x \ 1 = 45$ FACW Species 10.1 $x \ 2 = 20.20$			
Sap 1.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% (3 2		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6			
Sap 1. 2.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 0 3 2 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x \ 1 =$ 45 FACW Species 10.1 $x \ 2 =$ 20.20 FAC Species 3.2 $x \ 3 =$ 9.6 FACU Species 3 $x \ 4 =$ 12			
Sap 1. 2. 3.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 0 3 2 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0			
Sap 1. 2. 3. 4.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 0 3 2 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x \ 1 =$ 45 FACW Species 10.1 $x \ 2 =$ 20.20 FAC Species 3.2 $x \ 3 =$ 9.6 FACU Species 3 $x \ 4 =$ 12			
Sap 1. 2. 3. 4. 5.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 3 2 0 0 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0			
Sap 1. 2. 3. 4. 5. 6. 7. 8.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 (B)			
Sap 1. 2. 3. 4. 5. 6. 7. 8.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0		FACW	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0		FACW FAC	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0	of Total Cover:	FACW FAC	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = $B/A =$ 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. <u>H</u> 1.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0		FACW FAC	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation 1 (Explain)			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	0 20% 0 3 2 0 0 0 0 0 0 0 0 0 0 0 0 0	of Total Cover:	FACW FAC	Total % Cover of:Multiply by:OBL Species 45 $x \ 1 =$ 45 FACW Species 10.1 $x \ 2 =$ 20.20 FAC Species 3.2 $x \ 3 =$ 9.6 FACU Species 3 $x \ 4 =$ 12 UPL Species 0 $x \ 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = $B/A =$ 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2. 3.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia Salix rotundifolia	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2. 3. 4. 4. 5. 6. 7. 8. 9. 10. 10. 10. 10. 10. 10. 10. 10	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC Image: Constraint of the second	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 1. 2. 3. 4. 5. 5. 10. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC FAC FAC FAC OBL OBL FACW FACU FAC	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Multiply tic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. 7. 8. 8. 9. 10. 7. 8. 8. 7. 8. 8. 7. 8. 8. 9. 10. 7. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 8. 8. 7. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia Carex aquatilis Eriophorum scheuchzeri Eriophorum russeolum Poa alpina <	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC FAC I OBL OBL OBL FACW FACU FACW FACW	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes m % Bare Ground 5			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. S 5. 6. 7. 8. 9. 10. S 5. 6. 7. 8. 9. 10. S 5. 5. 6. 7. 8. 9. 10. S 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.	ling/Shrub Stratum 50% of Total Cover: Salix pulchra	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC	Total % Cover of:Multiply by:OBL Species 45 $x 1 =$ 45 FACW Species 10.1 $x 2 =$ 20.20 FAC Species 3.2 $x 3 =$ 9.6 FACU Species 3.2 $x 3 =$ 9.6 FACU Species 3 $x 4 =$ 12 UPL Species 0 $x 5 =$ 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes $(Where applicable)$ % Bare Ground 5 $7otal Cover of Bryophytes$ 90			
Sap 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. H 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. L 5. 6. 7. 8. 9. 10. 7. 8. 8. 9. 10. 7. 8. 8. 9. 10. 7. 8. 8. 7. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 8. 7. 8. 7. 8. 7. 7. 8. 7. 8. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7	ling/Shrub Stratum 50% of Total Cover: Salix pulchra Salix rotundifolia Carex aquatilis Eriophorum scheuchzeri Eriophorum russeolum Poa alpina <	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	of Total Cover:	FACW FAC FAC I OBL OBL OBL FACW FACU FACW FACW	Total % Cover of:Multiply by:OBL Species 45 x 1 = 45 FACW Species 10.1 x 2 = 20.20 FAC Species 3.2 x 3 = 9.6 FACU Species 3.2 x 3 = 9.6 FACU Species 3 x 4 = 12 UPL Species 0 x 5 = 0 Column Totals: 61.3 (A) 86.80 Prevalence Index = B/A = 1.416 Hydrophytic Vegetation Indicators: \checkmark Dominance Test is > 50% \checkmark Prevalence Index is ≤ 3.0 \square Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \square Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Plot size (radius, or length x width) $r=15m$ % Cover of Wetland Bryophytes m % Bare Ground 5			

Profile Descripti Depth	tion: (Describe to the depth needed to docur Matrix			ment the indicator or confirm the absence of indicators) Redox Features						
(inches)	Color (mois	it)	%	Color (moist)	%	Type ¹	Loc 2	Texture	Remarks	
0-4			100					Hemic Organics		
4-7	2.5Y	3/2	100					Silt Loam	_	
7-9			100					Hemic Organics	with mineral inclusions	
9-16	2.5Y	2.5/1	100					Silt Loam	positive reaction to alpha alpha dipyridol	
	2.31									
¹ Type: C=Cor	ncentration. D=I	Depletion.	RM=Reduce	ed Matrix ² Location	: PL=Poi	re Lining. RO	C=Root Cha	annel. M=Matrix		
Hydric Soil	Indicators:			Indicators for I	Problema	tic Hydric	Soils ³ :			
Histosol o	or Histel (A1)			Alaska Color Change (TA4) ⁴				Alaska Gleyed Without Hue 5Y or Redder		
Histic Epi	ipedon (A2)			Alaska Alpine swales (TA5)				Underlying Layer		
Hydroger	n Sulfide (A4)			Alaska Redox	With 2.5Y	' Hue		✓ Other (Explain in Rem	narks)	
Thick Da	rk Surface (A12))								
🗌 Alaska G	leyed (A13)							imary indicator of wetland	l hydrology,	
🗌 Alaska Re	edox (A14)			and an appropria	ite iandsc	ape position	i must be p	nesent.		
🗌 Alaska G	leyed Pores (A1	5)		⁴ Give details of	color char	nge in Rema	ırks.			
Postrictivo Los	ver (if present):									
	er (il present): easonal frost							Hydric Soil Presen	it? Yes 🖲 No 🔿	
								,		
Depth (ind Remarks:	(nes): 10									
HYDROLO								Cara da se In	directions (2 company or section d)	
	drology Indica								dicators (2 or more required)	
	icators (any o	ne is suff	icient)				()		ined Leaves (B9)	
	Water (A1)			Inundation Visible on Aerial Imagery (B7)					Patterns (B10)	
High Water Table (A2)			Sparsely Vegetated Concave Surface (B8)				 Oxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) 			
Saturation (A3)			Marl Deposits (B15)				_			
U Water Marks (B1)				Hydrogen Sulfide Odor (C1)				Salt Depos		
Sediment Deposits (B2) Drift deposits (B3)				Dry-Season Water Table (C2)					Stressed Plants (D1)	
Algal Mat or Crust (B4)			Other (Explain in Remarks)				Geomorph	ic Position (D2)		
	Iron Deposits (B5)								,	
	Soil Cracks (B6)								graphic Relief (D4)	
	()							► FAC-neutra	ai rest (D3)	
Field Observ		Yes \bigcirc	No 🖲	Danth (hoc):		7			
Surface Wate				Depth (inc	· _	-				
Water Table F		Yes 🖲		Depth (inc	hes):	2	Wet	land Hydrology Pres	ent? Yes 🖲 No 🔾	
Saturation Pre (includes capi		Yes 🖲	No \bigcirc	Depth (inc	hes):	0				
Recorded Da	ata (stream ga	uge, mor	nitor well, a	aerial photo, previ	ous insp	ection), if	available:			
D '										
Remarks:	reaction to alp	ha alnh-	a-dinvride							
D3seasona		na, aipile								
temp 37 ec 7										

Wetland Functional Class: Seasonally Flooded-Saturated Graminoid Meadow Wildlife Habitat: Patterned Wet Meadow



Hydric Soil Indicators: Other: positive reaction to alpha, alpha-dipyridol. Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Presence of Reduced Iron (C4).



Project/Site:	Barrow Environmental Obseratory	E	Borough/City:	North Slo	pe Borough Sampling Date:	31-Jul-15
Applicant/Ov	wner: UIC				Sampling Point:	BEO-39
Investigator((s): SLI, EKJ		Landform (hills	side, terrac	e, hummocks etc.): Flat	
Local relief ((concave, convex, none): concave		Slope: 0.0) ° Elevation: 25	
Subregion :	Northern Alaska	Lat.:	71.266226666	 6667	Long.: -156.449675 Da	atum: WGS84
Soil Map Uni					NWI classification: PEM1B	
•	hydrologic conditions on the site typical for this ti	me of vea	r? Yes (• No ()	(If no, explain in Remarks.)	
Are Vegeta		•	ly disturbed?		lormal Circumstances" present? Yes	• No O
Are Vegeta		-	problematic?		eded, explain any answers in Remarks.)	
-						
1	Y OF FINDINGS - Attach site map show	wing sar	mpling point	locations	s, transects, important features, o	etc.
Hydroph	iytic Vegetation Present? Yes \bigcirc No \bigcirc		ls t	he Samı	pled Area	
Hydric S	Soil Present? Yes No			hin a We		
	Hydrology Present? Yes No					
Remarks:	high center polygonal tundra, characterizing pol			on polygor	n tops. well developed troughs are PEM1	F wet sedge tundra
	with caraqu and eriophorum spp. common goos	se and car	idou scat.			
VEGETAT	FION - Use scientific names of plants. Li	st all sp	ecies in the p	olot.		
		Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree St	ratum	% Cover		Status	Number of Dominant Species	
1					That are OBL, FACW, or FAC:	<u>1</u> (A)
2.					Total Number of Dominant Species Across All Strata:	1 (B)
3					Percent of dominant Species	<u> </u>
4						00.0% (A/B)
5.					Prevalence Index worksheet:	
	Total Cover				Total % Cover of: Multiply I	by:
_Sapling/S	Shrub Stratum 50% of Total Cover:	0 20%	6 of Total Cover:	0	OBL Species 7 x 1 =	7
1		0			FACW Species $4.1 \times 2 =$	8.2
2					FAC Species 40 x 3 =	120
3					FACU Species $0 \times 4 =$	0
					UPL Species 0 x 5 =	0
					Column Totals: 51.1 (A)	135.2 (B)
7		0			Prevalence Index = B/A =	2.646
8					Hydrophytic Vegetation Indicators:	
		0			✓ Dominance Test is > 50%	
10.	Total Cover				✓ Prevalence Index is ≤ 3.0	
Herb St	50% of Total Cover:	_	-	0	Morphological Adaptations ¹ (Provide s Remarks or on a separate sheet)	supporting data in
1. Luzu	ula nivalis	30	\checkmark	FAC	Problematic Hydrophytic Vegetation ¹	(Explain)
2. Care	ex aquatilis	7		OBL	¹ Indicators of hydric soil and wetland hydro	logy must
3. Luzu	ula confusa			FAC	be present, unless disturbed or problematic	
4. Poa	arctica	5		FAC		
5. Erio	phorum russeolum	3		FACW	Plot size (radius, or length x width)	r=5m
6. Dup	ontia fischeri	1		FACW	% Cover of Wetland Bryophytes	
7. Peta	asites frigidus			FACW	(Where applicable)	
8.					% Bare Ground	3
9.					Total Cover of Bryophytes	45
10		0			Hydrophytic	
					Vegetation Present? Yes • No •	
	50% of Total Cover:	5.55 20%	% of Total Cover:	10.22		
Remarks:	50% lichen cover, including thamnolia, dactylir	าล				

WETLAND DETERMINATION DATA FORM - Alaska Region

	-	e depth nee atrix	eded to docum	nent the indicator or co	nfirm the ab dox Featu		cators)		
Depth (inches)	Color (mois	t)	%	Color (moist)	%	Type 1	Loc ²	Texture	Remarks
0-1			100					Fibric Organics	
1-3			100					Hemic Organics	
3-5		3/3	100		-			Silt Loam	
5-10		5,5	100					Hemic Organics	
5-10			100						
	······································								
¹ Type: C=Cor	centration. D=D	Depletion.	RM=Reduce	ed Matrix ² Locatio	n: PL=Por	e Lining. R	C=Root Cha	annel. M=Matrix	
Hydric Soil	indicators:			Indicators for	Problema	tic Hydric	Soils ³ :		
Histosol o	r Histel (A1)			Alaska Color	Change (T/	44) ⁴		Alaska Gleyed Without	Hue 5Y or Redder
✓ Histic Epi	pedon (A2)			Alaska Alpine	swales (TA	45)		Underlying Layer	
Hydroger	Sulfide (A4)			Alaska Redox	With 2.5Y	Hue		Other (Explain in Rema	arks)
Thick Dar	k Surface (A12)								
Alaska Gl	eyed (A13)			³ One indicator of and an appropri				imary indicator of wetland	hydrology,
_	dox (A14)					the hosing	i musi be p		
Alaska Gl	eyed Pores (A15	5)		⁴ Give details of	color chan	ge in Rem	arks.		
Restrictive Lav	er (if present):								
-	asonal frost							Hydric Soil Present	? Yes 🖲 No 🔾
Depth (inc								-	
Remarks:									
L									
HYDROLC	GY								
Wetland Hyd	rology Indica	tors:							licators (2 or more required)
	cators (any or	ne is suff	icient)					Water Stain	ed Leaves (B9)
	Vater (A1)			Inundation	Visible on	Aerial Ima	gery (B7)		atterns (B10)
	er Table (A2)			Sparsely Ve	-	oncave Sur	face (B8)		izospheres along Living Roots (C3)
Saturatio				Marl Depos				_	Reduced Iron (C4)
Water Ma				Hydrogen S	ulfide Odo	r (C1)		Salt Deposi	
	Deposits (B2)			Dry-Season		. ,		_	Stressed Plants (D1)
Drift dep	. ,			Other (Expl	ain in Rem	arks)		_ '	Position (D2)
	or Crust (B4)							Shallow Aqu	
_ '	osits (B5)								raphic Relief (D4)
	Soil Cracks (B6)							FAC-neutra	Test (D5)
Field Observ		X- ()			[_		
Surface Water		Yes C	-	Depth (in	ches):		_		
Water Table P		Yes 🖲	No 〇	Depth (in	ches):	7	Wet	land Hydrology Prese	nt? Yes $ullet$ No $igodom$
Saturation Pre (includes capi		Yes 🖲	No \bigcirc	Depth (in	ches):	3			
Recorded Da	ta (stream ga	uge, mor	nitor well, a	aerial photo, prev	ious inspe	ection), if	available:		
Remarks:	c .								
D3seasonal	Trost								

BEO-39

Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Histic Epipedon (A2). Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), Shallow Aquitard (D3).



PEM1B

Project	WETLAND DI		ION DATA ugh/City: N		- Alaska Region pe Borough Sampling Date: 31-Jul-15
	ant/Owner: UIC				Sampling Point: BEO-40
••	gator(s): SLI, EKJ	Lan	dform (hillsic	le, terrac	e, hummocks etc.): Undulating
	relief (concave, convex, none): concave		pe: 0.0 %		0
	jion : Northern Alaska		26463833333		Long.: -156.437638333333 Datum: WGS84
-	ap Unit Name:	Lat 11.2	2040303333	555	NWI classification: PEM1B
	matic/hydrologic conditions on the site typical for this t	ma of year?	Voc) No ()	
Are V Are V	/egetation □ , Soil □ , or Hydrology □ /egetation □ , Soil ✓ , or Hydrology □	significantly dis naturally proble	sturbed? ematic?	Are "N (If nee	(If no, explain in Remarks.) lormal Circumstances" present? Yes ● No ○ eded, explain any answers in Remarks.)
	MARY OF FINDINGS - Attach site map sho	wing samplin	ng point io	cations	
-	drophytic Vegetation Present? Yes No		Is the	e Sam	oled Area
	dric Soil Present? Yes		with	in a We	etland? Yes \bullet No \bigcirc
	etland Hydrology Present? Yes No No narks: high center, low relief polygonal tundra.				
/EGE	ETATION - Use scientific names of plants. L	ist all specie	s in the pl	ot.	
		Absolute D	ominant I	ndicator	Dominance Test worksheet:
	ree Stratum	% Cover S	Species?	Status	Number of Dominant Species
1.					That are OBL, FACW, or FAC: <u>2</u> (A)
2.					Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3.					Percent of dominant Species
4. 5.					That Are OBL, FACW, or FAC: 100.0% (A/B)
5.	Total Cover		L -		Prevalence Index worksheet:
6	ling/Shrub Stratum 50% of Total Cover:		otal Cover:	0	Total % Cover of: Multiply by:
		0 20/0011			OBL Species <u>17</u> x 1 = <u>17</u>
1.					FACW Species <u>8</u> x 2 = <u>16</u>
2. 3.					FAC Species <u>14.2</u> x 3 = <u>42.60</u>
3. 4.					FACU Species x 4 =
4. 5.					UPL Species $0 \times 5 = 0$
6.			<u>п</u> -		Column Totals: <u>39.2</u> (A) <u>75.60</u> (B)
7.					
		-			Prevalence Index = $B/A = 1.020$
		. <u> </u>			Prevalence Index = B/A = <u>1.929</u>
8.					Hydrophytic Vegetation Indicators:
8. 9.					Hydrophytic Vegetation Indicators: ✓ Dominance Test is > 50%
8. 9.		·			Hydrophytic Vegetation Indicators: ✓ Dominance Test is > 50% ✓ Prevalence Index is ≤3.0
8. 9. 10.	Total Cover	·	Total Cover:	0	Hydrophytic Vegetation Indicators: ✓ Dominance Test is > 50% ✓ Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide supporting data in
8. 9. 10.	Total Cover erb Stratum50% of Total Cover:	• • _0 20% of T			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)
8. 9. 10. <u>H</u> 1.	Total Cover erb Stratum	• • 0 20% of T •10		OBL	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)
8. 9. 10. <u>H</u> 1. 2.	Total Cover erb Stratum50% of Total Cover: Carex aquatilis Luzula nivalis Eriophorum anguatifolium	• 20% of T 10 7		OBL FAC	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)
8. 9. 10. <u>H</u> 1. 2. 3.	Total Cover erb Stratum 50% of Total Cover: Some of Total Cover:	<u> </u>		OBL FAC OBL	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
8. 9. 10. <u>H</u> 1. 2. 3. 4.	Total Cover <u>erb Stratum</u> Carex aquatilis Luzula nivalis Eriophorum angustifolium Petasites frigidus Poa arctica	<u> </u>		OBL FAC	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.
8. 9. 10. <u>H</u> 1. 2. 3.	Total Cover erb Stratum 50% of Total Cover: Some constraints	<u> </u>		OBL FAC OBL FACW	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. Plot size (radius, or length x width)
8. 9. 10. <u>H</u> 1. 2. 3. 4. 5.	Total Cover erb Stratum 50% of Total Cover: 50% of Total Cover:	<u> </u>		OBL FAC OBL FACW FAC	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.
8. 9. 10. H 1. 2. 3. 4. 5. 6.	Total Cover erb Stratum 50% of Total Cover: 50% of Total Cover:	 20% of T 10 10 7 7 7 3 1		OBL FAC OBL FACW FAC FACW	Hydrophytic Vegetation Indicators: \square Dominance Test is > 50% \square Prevalence Index is <3.0
8. 9. 10. <u>H</u> 1. 2. 3. 4. 5. 6. 7.	Total Cover 50% of Total Cover: Carex aquatilis Luzula nivalis Eriophorum angustifolium Petasites frigidus Poa arctica Arctagrostis latifolia Luzula confusa	 20% of T 		OBL FAC OBL FACW FAC FACW FAC	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. Plot size (radius, or length x width) <u>r=15m</u> (Where applicable)
8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8.	Total Cover 6 50% of Total Cover: 50% of Total Cover: Carex aquatilis	0 20% of T 10 10 7 7 7 3 1 1 0.1		OBL FAC OBL FACW FAC FAC FAC FAC	Hydrophytic Vegetation Indicators: \blacksquare Dominance Test is > 50% \blacksquare Prevalence Index is ≤ 3.0 \blacksquare Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \blacksquare Problematic Hydrophytic Vegetation ¹ (Explain) \blacksquare Problematic Hydrophytic Vegetation ¹ (Explain) \blacksquare Problematic Soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) <u>r=15m</u> % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>5</u> Total Cover of Bryophytes <u>45</u>
8. 9. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9.	Total Cover 6 50% of Total Cover: 50% of Total Cover: Carex aquatilis	$\begin{array}{c} & & \\ & & \\ 0 & & 20\% \text{ of T} \\ \hline \\ 0 & & 10 \\ 10 \\ 10 \\ 7 \\ 7 \\ 7 \\ 3 \\ 1 \\ 1 \\ 0 \\ 0$		OBL FAC OBL FACW FAC FAC FAC FAC	Hydrophytic Vegetation Indicators: \blacksquare Dominance Test is > 50% \blacksquare Prevalence Index is ≤ 3.0 \blacksquare Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) \blacksquare Problematic Hydrophytic Vegetation ¹ (Explain) \blacksquare Problematic Hydrophytic Vegetation ¹ (Explain) \blacksquare Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Plot size (radius, or length x width) r=15m % Cover of Wetland Bryophytes (Where applicable) % Bare Ground <u>5 </u> Total Cover of Bryophytes

Profile Description	M	latrix			Redox Fea	tures		_	
(inches)	Color (mois	st)	%	Color (moist)	%	Type 1	Loc 2	Texture	Remarks
0-16	10YR	4/3	80	5Y 4/2	2 20	D	PL	Silty Clay Loam	positive reaction to alpha alpha dipyridol a
16-18			100	5/2				Hemic Organics	
								·	
		<u>_</u>							
Type: C=Con		Depletion. I	RM=Reduc	ed Matrix ² Loca	tion: PL=P	ore Lining. R	C=Root Cha	annel. M=Matrix	
Hydric Soil		•		Indicators f					
Histosol d	or Histel (A1)			Alaska Col	or Change (TA4) ⁴		Alaska Gleved Witho	out Hue 5Y or Redder
Histic Epi	pedon (A2)			🗌 Alaska Alp	ine swales (TA5)		Underlying Layer	
Hydrogen	Sulfide (A4)			🗌 Alaska Red	lox With 2.5	5Y Hue		✓ Other (Explain in Re	marks)
	k Surface (A12))		3 On a indiant					d budualaan.
	eyed (A13)			and an appro				imary indicator of wetlar present.	ia nyarology,
	dox (A14) eyed Pores (A1!	-)		4 C : 1 1 1 1					
	eyed Pores (AI:	5)		⁴ Give details	of color cha	ange in Rema	rks.		
estrictive Lay	er (if present):								
-	asonal frost							Hydric Soil Prese	nt? Yes 🖲 No 🔾
Depth (inc	hac), 10								
emarks:	ion to alpha,	alpha-dip	yridol						
emarks: ositive react	ion to alpha,	alpha-dip	yridol						
emarks: ositive react YDROLC Vetland Hyd	ion to alpha, IGY Irology Indica	itors:							indicators (2 or more required)
emarks: ositive react YDROLO /etland Hyd Primary Ind	ion to alpha, DGY Irology Indica	itors:						Water St	ained Leaves (B9)
YDROLO /etland Hyd Surface \	GY Irology Indica Vater (A1)	itors:				n Aerial Imag		Water St	ained Leaves (B9) Patterns (B10)
YDROLC Yetland Hyd Trimary Indi Surface V High Wat	GY Irology Indica icators (any o Water (A1) ter Table (A2)	itors:		Sparsely	Vegetated	Concave Surf		Water St	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3)
YDROLO YDROLO Ydrimary Ind Surface V High Wat Saturatio	GY Irology Indica icators (any o Nater (A1) ter Table (A2) n (A3)	itors:		Sparsely	Vegetated oosits (B15)	Concave Surf		Water St	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4)
Primary Indi Verland Hyd Surface V Saturatio Water Ma	GY Irology Indica icators (any o Nater (A1) ter Table (A2) n (A3)	itors:		Sparsely	Vegetated	Concave Surf dor (C1)		Water St Drainage Oxidized Presence Salt Dep	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4)
Primary Indi Surface V Saturatio Water Ma	ion to alpha, OGY Irology Indica icators (any o Nater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2)	itors:		Sparsely Marl Dep Hydroge Dry-Seas	Vegetated oosits (B15) n Sulfide Oo	Concave Surf dor (C1) able (C2)		□ Water St □ Drainage □ Oxidized ✓ Presence □ Salt Dep □ Stunted □ Geomorp	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) posits (C5) pr Stressed Plants (D1) whic Position (D2)
Primary Indi Vetland Hyd Vetland Hyd Viffand Hyd Viffand Hyd Viffand Hyd Viffand High Wal Viffand Mater Ma Sedimen Algal Mater Ma Nater Ma	GY Irology Indica icators (any o Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4)	itors:		Sparsely Marl Dep Hydroge Dry-Seas	Vegetated posits (B15) n Sulfide Oc son Water T	Concave Surf dor (C1) able (C2)		□ Water St □ Drainage □ Oxidized ✓ Presence □ Salt Dep □ Stunted ☑ Geomorp ✓ Shallow	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) whic Position (D2) Aquitard (D3)
	GY Irology Indica icators (any o Nater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5)	i tors: ne is suffi		Sparsely Marl Dep Hydroge Dry-Seas	Vegetated posits (B15) n Sulfide Oc son Water T	Concave Surf dor (C1) able (C2)		□ Water St □ Drainage □ Oxidized ✓ Presence □ Salt Dep □ Stunted ☑ Geomorp ✓ Shallow □ Microtop	ained Leaves (B9) Patterns (B10) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) whic Position (D2) Aquitard (D3) ographic Relief (D4)
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BEO-40

PEM1B Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Other: positive reaction to alpha, alpha-dipyridol. Wetland Hydrology Indicators: Saturation (A3), Shallow Aquitard (D3).



WETLAND DETERM	INATION DA	TA FORM	- Alaska Regi	on		
Project/Site: Barrow Environmental Obseratory	_ Borough/City:	North Slop	be Borough	Sampling I	Date: 31-Ju	ul-15
Applicant/Owner: UIC			Sa	ampling Point:	BEO-4	11
Investigator(s): SLI, EKJ	Landform (hi	illside, terrac	e, hummocks etc	c.): Flat		
Local relief (concave, convex, none): none	Slope: 0.0) %/ 0.0	Elevation:	15		
Subregion : Northern Alaska Lat	.: 71.26167833	33334	Long.: -156.44	48546666667	Datum: V	VGS84
Soil Map Unit Name:			NWI	classification: F	PEM1B	
	antly disturbed? y problematic?	(If nee	ormal Circumsta ded, explain any	answers in Rem	Yes 🔍 No arks.)	\circ
Hydrophytic Vegetation Present? Yes No		riocations				
	ls	the Samp	oled Area			
	wi	ithin a We	tland?	Yes 🖲 No	0	
Remarks: nonpatterned tundra, common goose and caribou scat. VEGETATION - Use scientific names of plants. List all s	species in the		Dominance Tes			
Absolu Tree Stratum % Cov		Indicator Status	Number of Domi			
1.			That are OBL, F		3	(A)
2.			Total Number of			
3.			Species Across		3	(B)
4.			Percent of domir That Are OBL, F		100.0%	(A/B)
5.			Prevalence Ind	ex worksheet:		

5.				
· · · · · · · · · · · · · · · · · · ·				Prevalence Index worksheet:
Sapling/Shrub Stratum 50% of Total Cover:0	20% of T	otal Cover:	0	Total % Cover of: Multiply by:
		\checkmark		OBL Species x 1 =
1. Salix rotundifolia			FAC	FACW Species <u>35.1</u> x 2 = <u>70.2</u>
2	0			FAC Species x 3 =117.3_
3				FACU Species $0 x 4 = 0$
4	0			UPL Species $0 \times 5 = 0$
5				Column Totals: 74.2 (A) 187.5 (B)
6	0			Column Totals: <u>74.2</u> (A) <u>187.5</u> (B)
7				Prevalence Index = B/A =2.527_
8				Hydrophytic Vegetation Indicators:
9				✓ Dominance Test is > 50%
10	0			✓ Prevalence Index is $≤ 3.0$
Total Cover:	20			
Herb Stratum 50% of Total Cover: 10) 20% of T	otal Cover:	4	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Petasites frigidus	25	\checkmark	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Luzula confusa	7	\checkmark	FAC	¹ Indicators of hydric soil and wetland hydrology must
3. Arctagrostis latifolia	5		FACW	be present, unless disturbed or problematic.
4. Saxifraga nelsoniana	5		FAC	
5. Poa arctica	5		FAC	Plot size (radius, or length x width) r=15m
6. Alopecurus magellanicus	5		FACW	% Cover of Wetland Bryophytes
7. Luzula nivalis	2		FAC	(Where applicable)
8. Saxifraga cernua	0.1		FACW	% Bare Ground 5
9. Cochlearia officinalis	0.1		FAC	Total Cover of Bryophytes 40
10.	0			Hydrophytic
Total Cover:	54.2			Vegetation
50% of Total Cover: <u>27.</u>	1 20% of T	otal Cover:	10.84	Present? Yes No
Remarks: 1% Potentilla sp, trace stellaria longipes. 40% lic	hen cover.			

US Army Corps of Engineers

O-1 ID ID IP IA 1-4 10YR 3/3 100 silt toam 1-4 10YR 3/3 100 silt toam 1-10 5Y 4/1 90 10YR 4/4 10 C PL Silt Joan 10-12 5YR 2.5/1 100 silt Leam silt Leam vpe: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining. RC=Root Channel. M=Matt ydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol or Histel (A1) Alaska Alpine swales (TA5) Underlyir Hydrogen Suifide (A4) Alaska Redox With 2.SY Hue Other (EB) Hydrogen Suifide (A4) Alaska Redox With 2.SY Hue Other (EB) Alaska Gleyed (A13) ³ One indicator of hydrophytic vegetation, one primary indicator and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) ⁴ Give details of color change in Remarks. Strictive Layer (if present): Trype: seasonal frost Egarsely Vegetated Concave Surface (B8) Depth (inches): 12 Sparsely Vegetated Cooracey Surface (B8) Su	
1.4 10YR 3/3 100	ture Remarks
4-10 5Y 4/1 90 10YR 4/4 10 C PL Silty Clay Load 10-12 5YR 2.5/1 100	nics
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BEO-41

PEM1B Wetland Functional Class: Saturated Graminoid Meadow Wildlife Habitat: Moist Sedge-Shrub Meadow



Hydric Soil Indicators: Alaska Redox (A14). Wetland Hydrology Indicators: Saturation (A3), Shallow Aquitard (D3), FAC-neutral (D5).

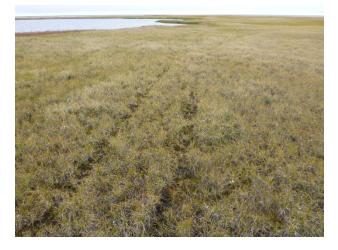


Appendix B. Verification Table and Site Photos.

BEO-V01

Site: Barrow, AK Date: 7/30/15 NWI: PEM1F

Field Notes: Documenting representative disturbance on BEO lands. Fairly light ATV trails. Per Oona Edwardson (UIC bear guard), residents access this area to collect goose eggs.



BEO-V02

Site: Barrow, AK Date: 7/30/15 NWI: PEM1F Field Notes: Light ATV damage to tundra. About 20ft long, tracks 4in deep.



BEO-V03 Site: Barrow, AK Date: 7/30/15 NWI: PEM1B Field Notes: Documenting light ATV damage to tundra. 5ft long, 2-4in deep.



B-2

BEO-V04

Site: Barrow, AK **Date:** 7/30/15 **NWI:** PEM1E

Field Notes: Mixed high and low center polys. All low relief. HCPs and rims of LCPs are as at PEM1B and PSS1B plots, and troughs and LCP centers are as at PEM1E Hgwst plots. Overall, PEM1B seems the best call for this area.



BEO-V05

Site: Barrow, AK Date: 7/30/15 NWI: PEM1B

Field Notes: Marking location of old drum, potential restoration opportunity. Drum in PEM1B high center polygons.



BEO-V06

Site: Barrow, AK Date: 7/30/15 NWI: PEM1B Field Notes: Documenting potential archaeological resource; send to Anne Jensen. About 4ft high, 25ft long, the only raised feature in the area.



B-3

BEO-V07 Site: Barrow, AK Date: 7/30/15 Dominant Species: Carex aquatilis, Eriophorum angustifolium NWI: PEM1F Field Notes: Low center polygonal tundra, Hgwst PEM1E centers and Hgmst PEM1B rims. Overall, PEM1E a good fit for community.



BEO-V08

Site: Barrow, AK Date: 7/30/15 NWI: PEM1F Field Notes: ATV tracks through wet sedge tundra.



BEO-V09 Site: Barrow, AK Date: 7/30/15 Dominant Species: Eriophorum scheuchzeri, Eriophorum angustifolium, Carex aquatilis aquatilis, Poa sp., Poa arctica NWI: PEM1F Field Notes:



B-4

BEO-V10

Site: Barrow, AK Date: 7/30/15 NWI: PEM1B Field Notes: Mixed high and low center polygonal tundra. High center polygons PEM1B Hgmst, troughs and basins of low center polygons PEM1E Hgwst.



BEO-V11

Site: Barrow, AK Date: 7/30/15 NWI: PEM1B

Field Notes: Potential restoration opportunity, appears to be old experiment. Small wooden structures in pieces. About 1.5ft x 1.5ft x 3ft each, 2 structures plus assorted wooden debris.



BEO-V12

Site: Barrow, AK Date: 7/31/15

Dominant Species: *Arctophila fulva, Hippuris vulgaris* **NWI:** PUBH

Field Notes: Series of small tundra ponds, likely too small to map. May provide surface water connection to slough at high water. Narrow vegetated fringe, grazed arcful. Ec 370, temp 48F.



BEO-V13 Site: Barrow, AK Date: 7/31/15 NWI: PEM1E Field Notes: Low center polygonal tundra, PEM1F basins.



BEO-V14

Site: Barrow, AK Date: 7/31/15 Dominant Species: Carex aquatilis, Eriophorum angustifolium NWI: PEM1E Field Notes: Indistinct mixed high and low center polygonal tundra. Likely best mapped as PEM1E.



BEO-V15 Site: Barrow, AK Date: 7/31/15 Dominant Species: Luzula arctica, Luzula confusa, Carex aquatilis NWI: PEM1E Field Notes: Mixed high and low center polygonal tundra.



Appendix C. Aquatic Site Assessment Forms.

C-1

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. N/A		Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt-generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. Y		HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y		Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	4 N	These small estuarine features are not directly connected to perennial channelized flow but they are connected to narrow semi-permanently flooded drainage features and floodwaters are likely to enter as channelized flow rather than sheet flow	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
 Waterbody is lake (>20 acres) (N/A if assessing wetlands). Rating Criteria: 4 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low 	5. N 2 (Y): Mode	rate	Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
B. Sediment, Nutrient (N and P), Toxicant			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow
Removal			active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	2. N/A		Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. N/A		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). 	5. N/A		Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Wetlands Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, 0-1 (Y) = Low Waters Rating Criteria: 1-2 (Y) = High, 0 (Y) = Low	2 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		Waterbodies do not perform erosion control functions.	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation from heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to trap more snow (resulting in a deeper snowpack) in winter.
 Wetland type does not have a permanently flooded hydrologic regime 	2. N		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
 Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes 	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. N		Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
6. Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
Wetlands Rating Criteria: $5 + (Y) = High$, 3 -4 (Y) = Moderate, $0-2$ (Y) = Low	1 (Y): Low		
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. N	Unvegetated water (see BEO-30, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. N/A		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. Y		A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: $3 (Y) = High,$ 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. N	Neither Steller's nor Spectacled Eiders have been documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y	Steller's Eiders and Spectacled Eiders are expected to use Estuarine Waters at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: $2-3$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	1 (Y): Mode	rate	
G. General Avian and Mammal Habitat			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or
Suitability			water, landscape setting, and documented species diversity are considered.
1. Wetland or water is undisturbed by human habitation or development.	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
2. Wetland or water is used by a high	2. N	Fewer than half of assessed mammal species regularly occurring in	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will
diversity of mammal species.		the study area are commonly found in the Brackish Water wildlife habitat type (Appendix C).	identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. N	Fewer than half of assessed avian species regularly occurring in the study area are commonly found in the Brackish Water wildlife habitat type (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well- developed emergent component). 	4. N		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	E2USP polygons represent less than 1% of the NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202). However, the habitat associated with this functional class is not used by a high diversity of bird or mammal species.	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	1 (Y): Low		

Function and Indicators H. General Fish Habitat Suitability	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet
			flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. Y	No fish were observed during the time of the field survey but a resident seasonal population is assumed based on proximity to nearshore marine waters.	A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. Y		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. Y		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, 	5. Y		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
1 (Y) = Moderate, 0 (Y) = Low Waters Rating Criteria: 2–5 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	4 (Y): High		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
1. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	1. N/A		Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	2. Y		HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	3. Y	The presence of permanently flooded waterbody indicates surface water storage.	Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	4 Y	Waters enter as sheet flow during spring break-up, no perennial channelized inputs were observed during the field survey or visible on aerial imagery.	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
 Waterbody is lake (>20 acres) (N/A if assessing wetlands). Rating Criteria: 4 (Y) = High, 	5. Y	Over half of the mapped waterbodies are over 20 acres.	Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
2-3 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
2. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	2. N/A		Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	3. N/A		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). Wetlands Rating Criteria: 4–5 (Y) = High, 	5. N/A		Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
2-3 (Y) = Moderate, $0-1$ (Y) = Low Waters Rating Criteria: $1-2$ (Y) = High, 0 (Y) = Low	2 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		Waterbodies do not perform erosion control functions.	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
 Wetland type does not have a permanently flooded hydrologic regime 	2. N		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
 Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes 	3. N		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. N		Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt 	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
Wetlands Rating Criteria: $5 + (Y) = High$, 3 -4 (Y) = Moderate, $0-2$ (Y) = Low	0 (Y): Low		
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. N	See BEO-02, BEO-07, BEO-17, and BEO-33 (Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. N/A		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N	Perennial channelized outputs were not observed during the field survey nor were they visible in aerial photography.	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	0 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. Y	One Steller's Eider was documented in West Twin Lake (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y	Steller's Eiders and Spectacled Eiders are expected to use Lakes and Ponds at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: $2-3$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	2 (Y): High		
G. General Avian and Mammal Habitat			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or
Suitability 1. Wetland or water is undisturbed by human habitation or development.	1. Y		water, landscape setting, and documented species diversity are considered. Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
 Wetland or water is used by a high diversity of mammal species. 	2. N	No assessed mammal species regularly occurring in the study area are commonly found in the Deep Open Water without Islands and Shallow Open Water without islands habitats, combined (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Wetland or water is used by a high diversity of avian species. 	3. Y	Over half (20 out of 35) assessed bird species regularly occurring in the study area are commonly found in the Deep Open Water without Islands and Shallow Open Water without islands habitats, combined (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well- developed emergent component). 	4. N		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	A recent remote sensing study indicated that thaw lakes accounted for 21.5% of the land area on the Barrow Peninsula (Frohn et al. 2005). Excluding marine and estuarine waters, L1UBH polygons account for over 10% and PUBH polygons over 1% of NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202).	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	2 (Y): Mode	rate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. Y	Lake depths are unknown but at least 4 of the mapped waterbodies have the potential to provide overwintering habitat.	Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. Y	No fish were observed during the time of the field survey but a resident seasonal population is assumed.	A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. Y		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. Y		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, (Y) = Moderate, 0 (Y) = Low 	5. Y		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Waters Rating Criteria: $2-5$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	5 (Y): High		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to
			the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
1. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	1. N	See BEO-01 and BEO-15 (Appendix A).	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	2. Y	Wetland is a lacustrine fringe HGM class but within an overall depressional feature and provides storage capacity similar to the immediately adjacent waterbody.	HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y	Most of the lacustrine fringe marshes in the BEO area are permanently flooded indicating storage capacity.	Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	4 Y		Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
 Waterbody is lake (>20 acres) (N/A if assessing wetlands). Rating Criteria: 4 (Y) = High, 	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
2-3 (Y) = Moderate, $0-1$ (Y) = Low	3 (Y): Mode	rate	
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
2. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	2. N	Wetland is a lacustrine fringe HGM class but within an overall depressional feature and provides storage capacity similar to the immediately adjacent waterbody.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. Y	See BEO-01 and BEO-15 (Appendix A).	Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). Wetlands Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low 	5. Y	See BEO-01 and BEO-15 (Appendix A).	Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Waters Rating Criteria: $1-2$ (Y) = High, 0 (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization			Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. Y	See BEO-01 and BEO-15 (Appendix A). No erosion noted in field or in aerial imagery.	n Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. Y	Organic soils (see BEO-01 and BEO-15, Appendix A).	Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. Y		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: $3(Y) = High$, 2 (Y) = Moderate, 0–1 (Y) = Low	3 (Y): High		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
Wetland type does not have a permanently flooded hydrologic regime	2. N		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
 Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes 	3. N	Lacustrine Fringe HGM class.	Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. Y	Organic soils (see BEO-01 and BEO-15, Appendix A).	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 6. Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt Wetlands Rating Criteria: 5+ (Y) = High, 3-4 (Y) = Moderate, 0-2 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0-1 (Y) = Low 	6. N 1 (Y): Low		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data indicate over 30% vegetation cover (see BEO-01 and BEO- 15, Appendix A).	- Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. Y		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N	Perennial channelized outputs were not observed during the field survey nor were they visible in aerial photography	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	2 (Y): Mode	orate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. N	Neither Steller's nor Spectacled Eiders have been documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y		e If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were ix inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: 2–3 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	1 (Y): Mode	prate	
G. General Avian and Mammal Habitat			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or
Suitability 1. Wetland or water is undisturbed by human	1. Y		water, landscape setting, and documented species diversity are considered. Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
habitation or development.	1. 1		Antihopogenic distributive tends to reduce the diversity of birds and manimals using an area.
2. Wetland or water is used by a high	2. N	No assessed mammal species regularly occurring in the study area	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will
diversity of mammal species.		are commonly found in the Aquatic Graminoid Marsh wildlife habitat type (Appendix C).	identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. N	Fewer than half of assessed avian species (16 out of 35) regularly occuring in the study area are commonly found in the Aquatic Graminoid Marsh wildlife habitat type (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well developed emergent component). 	4. Y		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N		s Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must to assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	2 (Y): Mode	srate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. Y	No fish were observed during the time of the field survey but a resident seasonal population is assumed. This wetland type is located immediately adjacent to open waterbodies that are assumed to support resident fish populations.	A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. Y		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. Y		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low 	5. Y		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Waters Rating Criteria: 2–5 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	4 (Y): High		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to
			the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tusssock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. Y	Typically composed of low center polygons with raised rims interspersed with small shallow open waterbodies.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. Y	This type was most often interpreted as a depressional type forming ir low areas within drained lake basins.	HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y	Small flooded shallow water ponds within this complex type indicate that storage is occurring.	Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	4 Y	No perennial surface water outlets observed during field survey or visible in aerial imagery.	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
 Waterbody is lake (>20 acres) (N/A if assessing wetlands). 	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
Rating Criteria: 4 (Y) = High, 2–3 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
2. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	2. Y	This type was most often interpreted as a depressional type forming ir low areas within drained lake basins.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. Y		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). Wetlands Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low 	5. Y	Field data document organic soils (see BEO-09, BEO-24, BEO-25, BEO-34, and BEO-35, Appendix A).	Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Waters Rating Criteria: $1-2$ (Y) = High, 0 (Y) = Low	5 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization			Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low	0 (Y): N/A	This wetland type does not directly abut relatively permanent channelized waters, thus this function is not applicable	
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold airtemperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
 Wetland type does not have a permanently flooded hydrologic regime 	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
3. Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes	3. Y	This type was most often interpreted as a depressional type forming i low areas within drained lake basins.	n Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. Y	Field data document organic soils (see BEO-09, BEO-24, BEO-25, BEO-34, and BEO-35, Appendix A).	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt Wetlands Rating Criteria: 5 + (Y) = High, 	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
3 - 4 (Y) = Moderate, 0-2 (Y) = Low	3 (Y): Mode	erate	
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data document over 30% cover herbaceous vegetation in wetland component, and over 10% cover herbaceous vegetation in water component of complex (see BEO-09, BEO-10, BEO-24, BEO-25, BEO-34, and BEO-35, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. Y		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
 Surface water outflow occurs outside of spring flooding. 	3. N	Perennial channelized outputs were not observed during the field survey nor were they visible in aerial photography	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	2 (Y): Mode	erate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. N	Neither Steller's nor Spectacled Eiders have been documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y	Steller's Eiders and Spectacled Eiders are expected to use Wet Graminoid Meadow and Shallow Open Water Complex at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: 2–3 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	1 (Y): Mode	rate	
G. General Avian and Mammal Habitat Suitability			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or water, landscape setting, and documented species diversity are considered.
1. Wetland or water is undisturbed by human habitation or development.	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
2. Wetland or water is used by a high diversity of mammal species.	2. Y	Over half (8 out of 9) assessed mammal species regularly occurring in the study area are commonly found in the Deep Polygon Complex habitat (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. Y	Over half (26 out of 35) assessed bird species regularly occurring in the study area are commonly found in the Deep Polygon Complex habitat (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well developed emergent component). 	4. Y		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N		Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N	Ponds within this complex are shallow, and would freeze fast during winter.	Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. Y	Because this wetland type is characterized by intermittent small shallow waterbodies fish are assumed present even though the likelihood is poor.	A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. Y		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
 Suitable spawning areas are present. Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low Waters Rating Criteria: 2–5 (Y) = High, 1 	4. Y 5. Y 4 (Y): High		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed. Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
(Y) = Moderate, 0 (Y) = Low	4 (1). Tiigii		Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are
Subsistence Use			assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. N	Forms within drainage features in BEO study area with non-patterned surface forms. No raised rims, tussock forming sedges or woody species present.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. Y		HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y	Surface water is present for most of the growing season indicating that storage is occurring	t Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
 Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow. 	4 Y	No perennial surface water outlets observed during field survey or visible in aerial imagery	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
5. Waterbody is lake (>20 acres) (N/A if assessing wetlands).	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
Rating Criteria: 4 (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	3 (Y): Mode	rate	
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	2. N	Forms within drainage features in BEO study area with non-patterned surface forms. No raised rims, tussock forming sedges or woody species present.	Tussocks and low to fall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. Y		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). 	5. Y	Field data document 7 inches of organics over mineral soil (see BEO- 31, Appendix A).	Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Wetlands Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low Waters Rating Criteria: $1-2$ (Y) = High, 0 (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization			Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. Y	Field data document 7 inches of organics over silty clay loam (see BEO-31, Appendix A).	Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. Y		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low	2 (Y): Mode	rate	
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N	Vegetation is present, but not continuous (see BEO-31, Appendix A).	Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
Wetland type does not have a permanently flooded hydrologic regime	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
 Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes 	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. N	Field data document 7 inches of organics over sitty clay loam (see BEO-31, Appendix A), which is not sufficiently thick to qualify as a histosol or histic epipedon.	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt 	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
Wetlands Rating Criteria: $5 + (Y) = High$, 3 -4 (Y) = Moderate, 0–2 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	2 (Y): Low		
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. N	Less than 30% herbaceous vegetation and no woody vegetation documented by field data (see BEO-31, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. Y		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N	Perennial channelized outputs were not observed during the field survey nor were they visible in aerial photography	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: $3 (Y) = High$, 2 (Y) = Moderate, $0-1 (Y) = LowWaters Rating Criteria: 2 (Y) = High, 0-1(Y) = Low$	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. N	Neither Steller's nor Spectacled Eiders have been documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. N		If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: $2-3$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): Low		
G. General Avian and Mammal Habitat			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or
Suitability			water, landscape setting, and documented species diversity are considered.
 Wetland or water is undisturbed by human habitation or development. 	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
 Wetland or water is used by a high diversity of mammal species. 	2. N	Fewer than half (2 out of 10) assessed mammal species regularly occurring in the study area are commonly found in the Halophytic Sedge Wet Meadow habitat (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. N	Fewer than half (6 out of 35) assessed bird species regularly occurring in the study area are commonly found in the Halophytic Sedge Wet Meadow wildlife habitat (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well developed emergent component). 	4. Y		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	No PEM1T polygons are present in the NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202). However, the habitat associated with this functional class is not used by a high diversity of bird or mammal species.	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low	2 (Y): Mode	rate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability		This wetland type was evaluated for fish habitat suitability because it directly abuts a permanently flooded estuarine type connected to nearshore marine waters	Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. Y		A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. Y		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. Y		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low 	5. Y		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Waters Rating Criteria: $2-5$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	4 (Y): High		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
1. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	1. Y	Typically composed of low center polygons with raised rims, tussocks are generally absent and woody stem shrubs occur in low density.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	2. Y		HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y	Surface water is present for most of the growing season indicating tha storage is occurring.	t Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
 Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow. 	4 Y	No perennial surface water outlets observed during field survey or visible in aerial imagery.	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
5. Waterbody is lake (>20 acres) (N/A if assessing wetlands).	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
Rating Criteria: 4 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low	4 (Y): High		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	2. Y	Typically composed of low center polygons with raised rims, tussocks are generally absent and woody stem shrubs occur in low density.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. Y		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 Y		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). Wetlands Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low 	5. Y	Field data document histic epipedons or histosols in this functional class (see BEO-04, BEO-05, BEP-06, BEO-08, BEO-11, BEO-12, BEO-26, BEO-27, and BEO-29, Appendix A).	Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Waters Rating Criteria: $1-2$ (Y) = High, 0 (Y) = Low	5 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		This wetland type does not directly abut relatively permanent channelized waters, thus this function is not applicable	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters no wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: $3 (Y) = High$, 2 (Y) = Moderate, 0–1 (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. Y		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
 Wetland type does not have a permanently flooded hydrologic regime 	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
3. Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. Y	Field data document histic epipedons or histosols in this functional class (see BEO-04, BEO-05, BEP-06, BEO-08, BEO-11, BEO-12, BEO-26, BEO-27, and BEO-29, Appendix A).	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
6. Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt Wetlands Rating Criteria: 5 + (Y) = High,	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
3 - 4 (Y) = Moderate, 0 - 2 (Y) = Low	4 (Y): Mode	erate	
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data document over 30% herbaceous vegetation in this functional class (see BEO-04, BEO-05, BEP-06, BEO-08, BEO-11, BEO-12, BEO-26, BEO-27, and BEO-29, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. Y		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N	Perennial channelized outputs were not observed during the field survey nor were they visible in aerial photography	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	2 (Y): Mode	erate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. Y	Three Spectacled Eiders documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y	Steller's Eiders and Spectacled Eiders are expected to use Semipermanently Flooded Wet Graminoid Meadow at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: $2-3 (Y) = High$, 1 (Y) = Moderate, 0 (Y) = Low	2 (Y): High		
G. General Avian and Mammal Habitat Suitability			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or water, landscape setting, and documented species diversity are considered.
1. Wetland or water is undisturbed by human habitation or development.	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
 Wetland or water is used by a high diversity of mammal species. 	2. Y	Over half of assessed mammals (8 out of 9) regularly occurring in the study area are commonly found in the combination of Patterned Wet Meadow and Nonpatterned Wet Meadow habitats (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Wetland or water is used by a high diversity of avian species. 	3. Y	Over half of assessed birds (29 out of 35) regularly occurring in the study area are commonly found in the combination of Patterned Wet Meadow and Nonpatterned Wet Meadow habitats (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well developed emergent component). 	4. Y		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	Excluding marine and estuarine waters, PEM1F polygons account for over 8% of NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202).	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N/A		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
 Fish are present. Herbaceous and/or woody vegetation is 	2. N/A 3. N/A		A documented occurrence confirms use by fish for at least some aspect of life history. Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter
present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	3. N/A		contributions to the food web.
4. Suitable spawning areas are present.	4. N/A		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, (Y) = Moderate, 0 (Y) = Low 	5. N/A		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Waters Rating Criteria: $2-5$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): N/A		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. Y	The surface form for this wetland consists of mixed low and high center polygons, raised ridges are present which support minimal woody shrub vegetation. Tussocks are not present.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. Y	This wetland type was typically interpreted as Flats HGM type, occurring within drained lake basin margins, however, the type is characterized by numerous micro-depressions formed along troughs or in degrading polygon centers that act as depressions and provide important storage capacity.	HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. Y	Low center polygons and troughs between high center polygons have semi permanent surface water indicating that storage is occurring in this wetland type	Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
 Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow. 	4 Y	Floodwaters are assumed to impact all wetland types typically occurring on the coastal plain during snow melt	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
5. Waterbody is lake (>20 acres) (N/A if assessing wetlands).	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
Rating Criteria: $4 (Y) = High$, 2–3 (Y) = Moderate, 0–1 (Y) = Low	4 (Y): High		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. Y		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
2. Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters).	2. Y	The surface form for this wetland consists of mixed low and high center polygons, raised ridges are present which support minimal woody shrub vegetation. Tussocks are not present.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	3. Y		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 N		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). Wetlands Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low 	5. Y	Field data document histosols or histic epipedons in this wetland functional class (see BEO-14, BEO-18, BEO-21, BEO-37 and BEO-38, Appendix A).	Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Waters Rating Criteria: 1–2 (Y) = High, 0 (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		This wetland type does not directly abut relatively permanent channelized waters, thus this function is not applicable	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. Y		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold air temperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
Wetland type does not have a permanently flooded hydrologic regime	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
3. Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. Y	Field data document histosols or histic epipedons in this wetland functional class (see BEO-14, BEO-18, BEO-21, BEO-37 and BEO- 38, Appendix A).	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt 	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
Wetlands Rating Criteria: 5 + (Y) = High, 3 -4 (Y) = Moderate, 0-2 (Y) = Low	4 (Y): Mode	prate	
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbor is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data document over 30% herbaceous vegetation in this wetland functional class (see BEO-14, BEO-18, BEO-21, BEO-37 and BEO-38, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. Y		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N	No channelized surface water outflow observed in field or in aerial imagery.	A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	2 (Y): Mode	prate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. Y	One Spectacled Eider was documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. 	3. Y	Steller's Eiders are expected to use Seasonally Flooded-Saturated Graminoid Meadow at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: 2–3 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	2 (Y): High		
G. General Avian and Mammal Habitat			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or
Suitability			water, landscape setting, and documented species diversity are considered.
1. Wetland or water is undisturbed by human habitation or development.	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
2. Wetland or water is used by a high	2. Y	Over half of assessed mammals (8 out of 9) regularly occurring in the	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will
diversity of mammal species.	2. 1	study area are commonly found in the Moist Sedge-Shrub Meadow habitat (Appendix C).	identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Wetland or water is used by a high diversity of avian species. 	3. Y	Over half of assessed birds (20 out of 35) regularly occurring in the study area are commonly found in the Moist Sedge-Shrub Meadow habitat (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well- developed emergent component). 	4. Y		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	Excluding marine and estuarine waters, PEM1E polygons account for over 12% of NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202).	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N/A	This wetland type does not have at least an intermittent surface water connection to a fish bearing waterbody, thus this function is not applicable	Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. N/A		A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. N/A		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. N/A		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
5. Juvenile rest areas present.	5. N/A		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Wetlands Rating Criteria: $2-4$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low			
Waters Rating Criteria: $2-5$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): N/A		
I. Educational, Scientific, Recreational, or			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are
Subsistence Use			assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. N	Salt killed tundra is a typical palustrine plant community type that has been disturbed by seasonal salt water input. The surface form is typically high center polygons where the vegetation on the high centers is dead. Raised polygon rims are absent as are extensive patches of woody shrubs.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. N	Salt killed tundra occurs on raised banks immediately adjacent to nearshore marine water and are interpreted in this study area as Flat HGM.	HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. N		Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
 Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow. 	4 Y	Floodwaters are assumed to impact all wetland types typically occurring on the coastal plain during snow melt	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
 Waterbody is lake (>20 acres) (N/A if assessing wetlands). Rating Criteria: 4 (Y) = High, 	5. N/A		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
2-3 (Y) = Moderate, 0–1 (Y) = Low	1 (Y): Low		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. N		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	2. N	Salt killed tundra is a typical palustrine plant community type that has been disturbed by seasonal salt water input. The surface form is typically high center polygons where the vegetation on the high centers is dead. Raised polygon rims are absent as are extensive patches of woody shrubs.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. N		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 N		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). 	5. Y	Field data document histic epipedons in this functional class (see BEC 23, Appendix A).	O Organic soils are effective at retaining heavy metals, some of which can be bound into long-term complexes with peat, particularly in cool climates.
Wetlands Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, 0-1 (Y) = Low Waters Rating Criteria: 1-2 (Y) = High, 0 (Y) = Low	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		This wetland type does not directly abut relatively permanent channelized waters, thus this function is not applicable	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters no wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
2. Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. N		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold airtemperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
 Wetland type does not have a permanently flooded hydrologic regime 	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
3. Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
4. Wetland soil profile is a histosol or histic epipedon	4. Y	Field data document histic epipedons in this functional class (see BEC 23, Appendix A).	Deep organic surface mats provide insulation and are a good predictor of stable shallow growing season active layers
5. Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
 Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt Wetlands Rating Criteria: 5 + (Y) = High, 	6. N		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
3 - 4 (Y) = Moderate, 0-2 (Y) = Low	3 (Y): Mode	erate	
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data document >30% herbaceous vegetation, and 5% deciduou woody vegetation, in this functional class (see BEO-23, Appendix A).	s Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. N		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N		A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. N	Neither Steller's nor Spectacled Eiders have been documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
2. Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries).	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
3. Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species.	3. N		If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
Rating Criteria: 2–3 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): Low		
G. General Avian and Mammal Habitat Suitability			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or water, landscape setting, and documented species diversity are considered.
1. Wetland or water is undisturbed by human habitation or development.	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
2. Wetland or water is used by a high diversity of mammal species.	2. N	No assessed mammals regularly occurring in the study area are commonly found in the Salt-killed Tundra habitat (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. N	Fewer than half of assessed birds (7 out of 35) regularly occurring in the study area are commonly found in the Salt-killed Tundra habitat (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well developed emergent component). 	4. N		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N	No PEM1S polygons are present in the NWI mapping (USFWS 2014) in the Northwest Coast watershed (HUC 19060202). However, the habitat associated with this functional class is not used by a high diversity of bird or mammal species.	Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: $4-5$ (Y) = High, 2-3 (Y) = Moderate, $0-1$ (Y) = Low	1 (Y): Low		

Function and Indicators H. General Fish Habitat Suitability	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet
			flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N/A		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. N/A		A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. N/A		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. N/A		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
5. Juvenile rest areas present.	5. N/A		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
Wetlands Rating Criteria: $2-4$ (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low			
Waters Rating Criteria: 2–5 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): N/A		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
 Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking). 	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
A. Flood Flow Regulation (Storage)			Function focuses on assessing the degree to which ACP wetlands store runoff or delay downslope movement of surface water. Riverine and estuarine waters below the OHWM do not perform this function (N/A). Wetlands that do not seasonally flood (e.g., pingos, tussock tundra) do not perform this function (N/A). Surface water storage by wetlands in permafrost regions can be significant, while the conventional view that subsurface storage is an effective modulator of stormflow is a misconception in permafrost regions (Woo 2012).
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	1. N	Within the BEO study area Saturated Graminoid Tundra occurred primarily in nonpatterned sloping bank features that border basins, drainage features or coastal banks.	Tussocks, low to tall (>20cm height) woody stems, and polygonal features provide surface roughness, which delays downslope movement of floodwaters by slowing velocity. These are persistent features, present during spring snowmelt- generated flooding.
 Wetland or water is a depressional HGM class or has depressional features capable of storage. 	2. N		HGM depressions occur in topographic depressions with closed contours, and flow vectors are from surrounding areas toward the center of the depression, allowing the accumulation of surface water. Ice-rich, raised polygonal rims act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012, Woo 2012).
 Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris). 	3. N		Visible signs of storage indicate that a wetland is capable of, and has in the past, retained additional water.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	4 Y	Floodwaters are assumed to impact all wetland types typically occurring on the coastal plain during snowmelt.	Floodwater entering as sheet flow, rather than channelized flow, is more likely to interact with surface roughness features.
5. Waterbody is lake (>20 acres) (N/A if assessing wetlands). Rating Criteria: 4 (Y) = High,	5. N/A 1 (Y): Low		Lakes (>20 acres) have substantial storage capacities, and modulate snowmelt-dominated streamflow regimes (Arp et al. 2012, Woo 2012).
2-3 (Y) = Moderate, 0-1 (Y) = Low	1(1): 201		
B. Sediment, Nutrient (N and P), Toxicant Removal			ACP soils have a relatively shallow active layer of unfrozen soil during the growing season. Cold temperatures and shallow active layer limit the ability of ACP wetlands to perform denitrification, thus this function focuses on the removal of inorganic sediments and adsorbed toxicants and nutrients through settlement. Sediment retention is used as a proxy for toxicant removal as many toxicants adsorb to sediments, and sediment retention is relatively easy to assess.
1. Slow-moving or still water is present.	1. N		Slow or still-moving water allows sediments and adsorbed toxicants to settle out of the water column, as opposed to swift- moving water that suspends sediments/toxicants.
 Dense tussocks, low to tall woody vegetation present, or raised polygonal rims are present (N/A if assessing waters). 	2. N	Within the BEO study area Saturated Graminoid Tundra occurred primarily in nonpatterned sloping bank features that border basins, drainage features or coastal banks.	Tussocks and low to tall (>20cm height) woody stems provide surface roughness, which slows water velocity and allows sediments and adsorbed nutrients and toxicants to settle out of the water column. Raised polygonal rims provide surface roughness, which delays downslope movement of floodwaters by slowing velocity, and also act as micro-depressions for long-term storage over the growing season (Liljedahl et al. 2012). These are persistent features, present during spring snowmelt-generated flooding.
 At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters). 	3. N		Rooted vegetation takes up nutrients directly from the soil, which may encourage nutrients to move from water to soil to maintain equilibrium.
 Sediment deposits are present, providing evidence of deposition during natural flood events. 	4 N		Visible signs of sedimentation indicate that a wetland is capable of, and has in the past, allowed sediments and presumably adsorbed nutrients and toxicants to settle out of the water column.
 Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters). 	5. Y	Field data document histosols or histic epipedons for nearly half (5 or of 11) of plots sampled in this functional class (see BEO-03, BEO-13 BEO-19, BEO-20, BEO-22, BEO-28, BEO-32, BEO-36, BEO-39, BEO 40, and BEO-41, Appendix A).	
Wetlands Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 1–2 (Y) = High, 0 (Y) = Low	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
C. Erosion Control and Shoreline Stabilization		This wetland type does not directly abut relatively permanent channelized waters, thus this function is not applicable	Function reflects the ability of a wetland to stabilize banks through anchoring soils and dissipating erosive forces. This function is typically only performed by wetlands directly abutting a relatively permanent channelized water. Neither waters nor wetlands that do not abut relatively permanent channelized waters perform this function (N/A). Depending on the mapping and classification, however, some individual wetlands that do not actually directly abut a relatively permanent water (rivers and streams) may be included in this assessment.
 Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion. 	1. N/A		Plants bind soils with their root systems, and slow incoming waves or currents through increased surface roughness.
Soils are not predominantly sandy or silty, and are not ice rich.	2. N/A		Sandy and silty soils and ice rich permafrost are more susceptible to erosion.
3. Historical aerial photography (if available) indicates stable shoreline features.	3. N/A		Visible evidence of stable shorelines indicates a lack of historical erosion, which may be due any one or a combination of factors including bank erodability, erosive force, or protection afforded by adjacent wetlands.
Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0-1 (Y) = Low	0 (Y): N/A		
D. Maintenance of Soil Thermal Regime			Added as a function due to the presence of continuous permafrost in study area.
1. Vegetation cover is continuous	1. Y		Biomass or vegetation height are good indicators of areas with stable shallow active layers. Thick vegetation provides shading and insulation both to heat escaping during the summer and cold airtemperatures in winter. Thick vegetation also tends to have deeper snowpacks in winter.
2. Wetland type does not have a permanently flooded hydrologic regime	2. Y		Water bodies typically have a thaw bulb or no permafrost (Brosten et. al. 2006)
 Wetland type is not within the riverine, lacustrine fringe or estuarine fringe HGM classes 	3. Y		Vegetation types that get seasonal flooding from lake and river surface water fluctuations typically are lacking permafrost or active layer is very deep (Brosten et. al 2006)
 Wetland soil profile is a histosol or histic epipedon 	4. Y	Field data document histosols or histic epipedons for nearly half (5 or of 11) of plots sampled in this functional class (see BEO-03, BEO-13 BEO-19, BEO-20, BEO-22, BEO-28, BEO-32, BEO-36, BEO-39, BEC 40, and BEO-41, Appendix A).	•
Wetland is located in the discontinuous permafrost zone on a north facing aspect	5. N		North facing slopes in the discontinuous permafrost zone are areas where permafrost may persist (Yi et. al. 2009)
6. Wetland occupies a raised on convex landform that does not receive and store significant floodwaters during snowmelt	6. Y		Infiltration of floodwaters to the active layer adds significant energy, in areas receiving relatively larger amounts of snowmelt floodwaters the active layer may be greater (Putkonen 1998)
Wetlands Rating Criteria: $5 + (Y) = High$, 3 -4 (Y) = Moderate, $0-2$ (Y) = Low	5 (Y): High		
E. Organic Matter Production and Export			Organic matter production and export assesses primary production and subsequent flushing of organic material to downstream waters. Wetlands that are not flooded at least every 10 years do not perform this function as flooding is the transport mechanism for moving organics to downstream waters. If no flooding occurs, production may be high but no carbon is exported.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1. Y	Field data document over 30% herbaceous cover in this functional class (see BEO-03, BEO-13, BEO-19, BEO-20, BEO-22, BEO-28, BEO-32, BEO-36, BEO-39, BEO-40, and BEO-41, Appendix A).	Herbaceous vegetation is generally more productive than aquatic bed, scrub-shrub, or forested wetland vegetation Adamus et al. (1991). Higher productivity generates more carbon available for export. Deciduous woody species produce higher quality litter than evergreen woody species, which have recalcitrant litter with high concentrations of lignin and phenolic compounds (Wardle 2002).
2. At least 10% of wetland is seasonally flooded (N/A for waters).	2. N		Surface water controls many differences between wetland types, including decomposition (Bayley and Mewhort 2004). Increased surface water promotes increased decomposition, which may facilitate carbon export (Adamus 2013).
3. Surface water outflow occurs outside of spring flooding.	3. N		A longer duration of surface water outflow provides more opportunity for organic matter export. While the vast majority of ACP wetlands flood during spring breakup, fewer have surface water outflow later in the growing season, when small beaded streams can stop flowing and waterbodies become disconnected.
Wetlands Rating Criteria: 3 (Y) = High, 2 (Y) = Moderate, 0–1 (Y) = Low Waters Rating Criteria: 2 (Y) = High, 0–1 (Y) = Low	1 (Y): Low		

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
F. TES Support			Assesses the ability of a wetland or water to support Threatened or Endangered Species (TES) per the Endangered Species Act (ESA) and species or subspecies of fish or wildlife in Alaska per the Alaska Department of Fish and Game (ADF&G) as defined by Alaska Statute 16.20.190.
 Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. 	1. Y	Steller's Eiders documented in this functional class within the study area (ALCC 2012).	A documented occurrence confirms use by TES for at least some aspect of life history, even if the community isn't a preferred or designated critical habitat.
 Wetland or water contains documented critical habitat, designated by the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries). 	2. N		NOAA Fisheries and USFWS, the two federal agencies responsible for administering the ESA, are required to designate critical habitat for listed species. Critical habitat is specific geographic areas containing features essential to the conservation of an endangered or threatened species, including areas not currently occupied but necessary for recovery.
 Wetland or water is a known preferred habitat for state or federally listed threatened or endangered species. Rating Criteria: 2–3 (Y) = High, 	3. Y	Steller's Eiders are expected to use Saturated Graminoid Meadow at some point during their life cycle (Appendix D)	If specific work on habitat preference in the study area (e.g. Johnson et al. 2014) is not available, habitat preferences were inferred using the literature based habitat use tables provided in Appendix D of this report.
1 (Y) = Moderate, 0 (Y) = Low	2 (Y): High		
G. General Avian and Mammal Habitat Suitability			Assesses whether the wetland or water supports a high diversity of birds and mammals. Characteristics of the wetland or water, landscape setting, and documented species diversity are considered.
 Wetland or water is undisturbed by human habitation or development. 	1. Y		Anthropogenic disturbance tends to reduce the diversity of birds and mammals using an area.
Wetland or water is used by a high diversity of mammal species.	2. Y	Over half of assessed mammals (8 out of 9) regularly occurring in the study area are commonly found in the Moist Sedge-Shrub Meadow habitat (Appendix C).	If no systematic wildlife surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
Wetland or water is used by a high diversity of avian species.	3. Y	Over half of assessed birds (20 out of 35) regularly occurring in the study area are commonly found in the Moist Sedge-Shrub Meadow habitat (Appendix C).	If no systematic avian surveys were conducted in the project area or near vicinity, a review of previous wildlife studies will identify which species are likely to regularly occur and what habitats they occupy (see Habitat Evaluation in accompanying report).
 Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well- developed emergent component). 	4. N		A greater variety of vegetation and cover types is present in communities with high vegetation-water interspersion. Communities with high vegetation water interspersion may support species adapted to open water, edge environments, and well-vegetated components of the community.
5. Wetland or water is considered rare at a regional scale.	5. N		Disproportionately high habitat use, in relation to habitat availability, may indicate habitat preference. Habitat availability must be assessed at a larger, regional scale rather than the project mapping which is limited to construction boundaries
Rating Criteria: 4–5 (Y) = High, 2–3 (Y) = Moderate, 0–1 (Y) = Low	3 (Y): Mode	rate	

Function and Indicators	Rating	Project Rationale	Arctic Coastal Plain (ACP) Rationale
H. General Fish Habitat Suitability			Applicable to all waters, and wetlands with perennial or intermittent surface water connection to a fish bearing water. Sheet flow during spring snowmelt is not considered a sufficiently reliable connection to fish-bearing waters for this function to be applicable.
 Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands). 	1. N/A		Assessing whether the wetland or water provides overwintering habitat, which is limited on the ACP.
2. Fish are present.	2. N/A		A documented occurrence confirms use by fish for at least some aspect of life history.
 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 	3. N/A		Overhanging vegetation provides refuge from predators, shade to maintain water temperatures, and detrital matter contributions to the food web.
4. Suitable spawning areas are present.	4. N/A		Suitable spawning habitat may include aquatic vegetation, deep lakes, and mixed gravel substrate in streambed.
 Juvenile rest areas present. Wetlands Rating Criteria: 2–4 (Y) = High, 	5. N/A		Juvenile rest areas include flooded wetlands, pools with organic debris, and/or overhanging vegetation.
1 (Y) = Moderate, 0 (Y) = Low Waters Rating Criteria: 2–5 (Y) = High, 1 (Y) = Moderate, 0 (Y) = Low	0 (Y): N/A		
I. Educational, Scientific, Recreational, or Subsistence Use			Consumptive (e.g. hunting, fishing, food gathering) and non-consumptive uses, as well as educational and scientific use are assessed.
 Site has documented scientific or educational use. 	1. Y	BEO lands	Scientific use function assesses whether the wetland has been used in scientific studies (peer-reviewed or grey literature), excluding studies necessitated by NEPA or project-permitting. Educational assesses the educational value of the wetland to the community (e.g. contains interpretive signs, is historically used for ecology or species identification classes, is a known long term research site with established permanent sample plots, etc.).
2. Wetland or water is in public ownership.	2. Y		Wetlands or waters in public ownership are more accessible to a variety of people.
3. Accessible trails are available.	3. Y		Visible or established trails demonstrate that the wetland or water is accessible, and may be used for recreational or subsistence purposes.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	4. Y		Observed or documented consumptive use confirms that a community is used for subsistence purposes.
Rating Criteria: $3-4$ (Y) = High, 2 (Y) = Moderate, $0-1$ (Y) = Low	4 (Y): High		

	Wildlife Habitat and associated *Wetland Functional Class										
		Brackish Water * <i>Estuarine Waters</i>	Deep Open Water without Islands *Lakes and Ponds	Shallow Open Water without Islands *Lakes and Ponds	Aquatic Graminoid Marsh *Lacustrine Fringe Graminoid Marsh	Deep Polygon Complex * <i>Wet Graminoid Meadow and Shallow</i> <i>Open Water Complex</i>	Halophytic Sedge Wet Meadow * <i>Semipermanently Flooded Tidal Wet Meadow</i>	Nonpatterned Wet Meadow *Semipermanently Flooded Wet Graminoid Meadow	Patterned Wet Meadow *Semipermanently Flooded Wet Graminoid Meadow	Moist Sedge-Shrub Meadow *Saturated Graminoid Meadow and *Seasonally Flooded-Saturated Graminoid Meadow	Salt-killed Tundra *Satureated Salt-killed Meadow
BIRDS											
Greater White-fronted Goose	·	х	х	х	Х	х	Х	х	х	Х	Х
Brant	Branta bernicla	Х	х	Х					х		
Tundra Swan	Cygnus columbianus	х	Х	Х	Х	Х			Х	Х	
Northern Shoveler	Anas clypeata		Х	Х	х	Х			Х		
Northern Pintail	Anas acuta		Х	х	х	Х			Х		
Green-winged Teal	Anas crecca		х	х	Х	х			х		
Steller's Eider	Polysticta stelleri	х	х	х	Х	х			х	Х	
Spectacled Eider	Somateria fischeri	х	х	х	Х	х		х	х		
King Eider	Somateria spectabilis	х	х	х	Х	х			х	Х	
Long-tailed Duck	Clangula hyemalis	х	х	х	Х	х		х	х	Х	
Red-throated Loon	Gavia stellata	Х	Х	Х	Х	х		Х	Х		

Appendix D. Habitat evaluation for birds and mammals likely to occur regularly in BEO study area, Alaska, 2015 (x indicates a wildlife habitat considered important for a species).

Wildlife Habitat and associated *Wetland Functional Class											
		Brackish Water * <i>Estuarine Waters</i>	Deep Open Water without Islands *Lakes and Ponds	Shallow Open Water without Islands *Lakes and Ponds	Aquatic Graminoid Marsh *Lacustrine Fringe Graminoid Marsh	Deep Polygon Complex *Wet Graminoid Meadow and Shallow Open Water Complex	Halophytic Sedge Wet Meadow *Semipermanently Flooded Tidal Wet Meadow	Nonpatterned Wet Meadow * <i>Semipermanently Flooded Wet</i> Graminoid Meadow	Patterned Wet Meadow *Semipermanently Flooded Wet Graminoid Meadow	Moist Sedge-Shrub Meadow *Saturated Graminoid Meadow and *Seasonally Flooded-Saturated Graminoid Meadow	Salt-killed Tundra *Satureated Salt-killed Meadow
Pacific Loon	Gavia pacifica		х	х	х	х					
American Golden-Plover	Pluvialis dominica					х	х	х	х	Х	х
Semipalmated Plover	Charadrius semipalmatus										х
Ruddy Turnstone	Arenaria interpres										х
Dunlin	Calidris alpina	х		х	x	х	х	х	х	Х	х
Baird's Sandpiper	Calidris bairdii										х
Pectoral Sandpiper	Calidris melanotos				х	х		х	х	Х	
Semipalmated Sandpiper	Calidris pusilla	х		х		х	х		х	Х	
Western Sandpiper	Calidris mauri	х		х		х	х		х	Х	
Long-billed Dowitcher	Limnodromus scolopaceus	х		х	х	х	х	х	х	Х	
Wilson's Snipe	Gallinago delicata					х		х	х		
Red-necked Phalarope	Phalaropus lobatus			х	х	х			х		
Red Phalarope	Phalaropus fulicarius			х	х	х			х		

				Wildlife	Habitat a	and associ	ated *W	etland Fu	nctional	Class	
		Brackish Water * <i>Estuarine Waters</i>	Deep Open Water without Islands * <i>Lakes and Ponds</i>	Shallow Open Water without Islands * <i>Lakes and Ponds</i>	Aquatic Graminoid Marsh *Lacustrine Fringe Graminoid Marsh	Deep Polygon Complex * Wet Graminoid Meadow and Shallow Open Water Complex	Halophytic Sedge Wet Meadow *Semipermanently Flooded Tidal Wet Meadow	Nonpatterned Wet Meadow * <i>Semipermanently Flooded Wet</i> Graminoid Meadow	Patterned Wet Meadow * <i>Semipermanently Flooded Wet Graminoid Meadow</i>	Moist Sedge-Shrub Meadow *Saturated Graminoid Meadow and *Seasonally Flooded-Saturated Graminoid Meadow	Salt-killed Tundra * <i>Satureated Salt-killed Meadow</i>
Pomarine Jaeger	Stercorarius pomarinus					х		х	х	х	
Parasitic Jaeger	Stercorarius parasiticus					х		х	Х	Х	
Long-tailed Jaeger	Stercorarius longicaudus					х				Х	
Glaucous Gull Arctic Tern	Larus hyperboreus	х	Х	х		х		х	Х	Х	
Snowy Owl	Sterna paradisaea Bubo scandiacus			Х				v	X	v	
Short-eared Owl	Asio flammeus							X X	x x	x x	
Common Raven	Corvus corax					х		X	X	X X	
Lapland Longspur	Colvas corax Calcarius lapponicus					A X		X	X	X	
Snow Bunting	Plectrophenax nivalis					Λ		Λ	Λ	Λ	х
Savannah Sparrow	Passerculus sandwichensis							х	х	х	28
MAMMALS											
Collared lemming	Dicrostonyx groenlandicus					х					
Brown lemming	Lemmus trimucronatus					х		х	Х	х	

UIC Mitigation Bank Wetlands ASA

	Wildlife Habitat and associated *Wetland Functional Class										
		Brackish Water * <i>Estuarine Waters</i>	Deep Open Water without Islands * <i>Lakes and Ponds</i>	Shallow Open Water without Islands * <i>Lakes and Ponds</i>	Aquatic Graminoid Marsh *Lacustrine Fringe Graminoid Marsh	Deep Polygon Complex * Wet Graminoid Meadow and Shallow Open Water Complex	Halophytic Sedge Wet Meadow * <i>Semipermanently Flooded Tidal Wet Meadow</i>	Nonpatterned Wet Meadow * <i>Semipermanently Flooded Wet</i> Graminoid Meadow	Patterned Wet Meadow * <i>Semipermanently Flooded Wet Graminoid Meadow</i>	Moist Sedge-Shrub Meadow *Saturated Graminoid Meadow and *Seasonally Flooded-Saturated Graminoid Meadow	Salt-killed Tundra *Satureated Salt-killed Meadow
Root vole (tundra vole)	Microtus rutilus					х		x	Х	х	
Tundra shrew	Sorex tundrensis					х		х	х	Х	
Barren ground shrew	Sorex ugyunak					х	х		х	Х	
Arctic fox	Vulpes lagopus					х			х	Х	
Brown bear	Ursus arctos					х		х	х	х	
Ermine (short-tailed weasel)	Mustela erminea					х		х	х	х	
Least weasel	Mustela nivalis					х	х	х	х	Х	
Caribou	Rangifer tarandus					х				х	

^a Species listed are likely to occur regularly in the study area during some portion of their life history (e.g., breeding/mating, staging, migration, denning/wintering). Numbers present could be high or low depending on natural fluctuations in abundance. Species that could occur sporadically or for which suitable habitat is not present in the study area are not listed. Habitat use for birds and mammals was determined from available literature (Johnson and Herter 1989, MacDonald and Cook 2009, Norton et al. 1993, Pitelka 1974, and Safine 2011, 2012, 2013) and from field observations in the study area during late July 2015.

Appendix D. Continued.

Appendix B: AKWAM Assessment Forms

Appendix A Wetland Assessment Data Form

<u>Digital Form</u> – Use only if completing on a computer. Otherwise, use form in AKWAM manual.

Use this form to assess areas that are primarily wetlands (versus waterbodies). For waterbodies, use the Waterbody Categorization Form.

1. Project name:Charles Etok Edwardsen Mitigation Bank	2. Assessment Area #(s): <u>AA1 - Palustrine Flats</u>
 Evaluation date: Mo. <u>07</u> Day <u>30-31</u> Yr. <u>2015</u> Evaluator(s) and affiliation: <u>SLI, EKJ: ABR</u> Purpose of evaluation: 	
 Wetland/waterbody potentially affected by a proposed project Mitigation wetlands; post-construction 6. Wetland location(s): 	 Mitigation wetlands; pre-construction Other <u>Mitigation wetlands; preservation; Current/with</u> project condition
Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; S. 1; Umia	t Meridian
Lat. (dec.deg.): 71.2823 Long.: -156.5088 Datum: NAD83	Nearest community: Utqiagvik, AK
Watershed: <u>Elson Lagoon - Frontal Beaufort Sea (12th level HU</u>	<u>C 190602020105)</u>
Ecoregion (from USCOE 2007):	
7. Identifying numbers ofrelated data: wetland determination form photos see ABR Baseline Assessment Appendices A and C GPS v	
Map (#) showing AA: <u>Figure 6</u> (closely follow the User's Manual ins Briefly describe the features that define the limits of the AA (e.g elevation): AA1 consists of NWI class palustrine flats (PEM1E, PEM1B, F For the purposes of AKWAM, the boundaries of the AA do no is bordered on the N and E by the Beaufort Sea and a large sl W by ponds/lakes and depressional wetlands. Where there w 1000 ft from the AR-9 boundary.	., tributary, wetland/upland boundary, extreme low tide PEM1S), as part of a larger wetland complex. t end with the edges of the project boundary. It ough, on the S by the Mayoek River, and on the
8. Wetland size (total acres, not just AA): <u>1000+</u> acres (visually estimated	ted) or acres (measured, e.g., in GIS)
9. Assessment area (AA) size: acres (visually estimate	ed) approximately 1400 acres (measured)
Note: Waterbodies were not considered in this AA even when	adjacent to wetlands because there was not direct
connection. 1192.87 acres of the AA are within the project site.	
Acreage of the AA MINUS the part that is waterbody that will be separa AA 10. Classification of Wetland and Waterbody in the Wetlland AA:	ately assessed using the waterbody form: $\underline{1400}$ acres of $\underline{wetland}$ in

Class (Cowardin)	Water Regime (Cowardin)	Modifier (if anv: Cowardin)	% of AA
EM - PEM1E	S/I		49%
EM - PEM1B, PEM1S	T/E		51%

HGM Class (Brinson)	% of AA
F	100%
	%
	%
	%

HGM Classes: Riverine (R), Depressional (D), Slope (S), Flat (F), Lacustrine Fringe (LF)

Abbreviations: Cowardin Classes: Forested Wetland (FO), Scrub-Shrub Wetland (SS), Emergent Wetland (EM), Moss-lichen Wetland (ML), Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes: Permanent/Perennial (P/P),

Seasonal/Intermittent (S/I), Temporary/Ephemeral/Saturated (T/E)

Modifiers: Excavated (X), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A), Beaver-modified (B)

11. Estimated relative abundance of similar wetlands within the same 6th level hydrologic unit subregion (see definitions in user's manual):

(check one)

Unknown

Rare Common Abundant

What information sources did you use for this estimate? Estimate based on visual observation of palustrine flat wetlands within HUC.

12. General condition of AA:

i. Disturbance (see user's manual for descriptions of disturbance levels; check appropriate box):

Conditions adjacent to AA		Predominant conditions adjacent to (within 500 feet of) the AA, <u>plus</u> any area that drains into the AA						
Conditions within AA	Adjacent land is in a natural state	Adjacent land has experienced minimal or minor disturbance	Adjacent land is substantially disturbed					
AA is in a natural state	Iow disturbance	low disturbance	moderate disturbance					
AA has experienced minimal or minor disturbance	moderate disturbance	moderate disturbance	high disturbance					
AA is substantially disturbed	☐ high disturbance	☐ high disturbance	high disturbance					

Describe the disturbance within the AA (type, age, intensity, source of disturbance, location): Very isolated instances of minimal disturbance found, like small equipment or a few ATV tracks, mostly outside of this AA. Considered to be essentially natural

ii. Consider the 6th level HU containing the AA again. If you estimate that more than 10% of the land in the 6th level HU is disturbed, check

here , and choose (below) the disturbance level that is one level higher:

low disturbance moderate disturbance high disturbance

iii. List anynoxious or invasive plant or animal species in the AAor surrounding lands (specify which are in the AA): None.

iv. Brieflydescribe the AAand surrounding land use and habitat types (dominant species, water source, topography, approximate slope, inlets and outlets, land use, relationship to other AAs, adjacent vegetation types and land uses):

AA1 consists of NWI class palustrine (PEM1E, PEM1B, PEM1S), flats (HGM) graminoid (sedge) meadow tundra, part of a larger wetland complex with depressional wetlands and open water ponds and lakes. PEM1B (Saturated Graminoid Meadow) is the most common functional class, which has high centered polygons with dwarf shrubs and low-lying troughs with standing water. The second most common functional class is PEM1E (Seasonally Flooded-Saturated Graminoid Meadow), which has patterned ground features supporting moist tundra types (high) and wetter obligate sedge communities (depression). Typical graminoid species include Petasites frigidus, Luzula nivalis, Carex aquatilis, and Eriophorum angustifolium. The smallest class (9%) is PEM1S (Saturated Saltkilled Meadow), which occurs in discrete areas on banks of marine waters where storm surge have allowed salt kill of palustrine vegetation on high center polygons. Depressions have intact moist emergent plant communities.

13. Structural Diversity of AA (based on number of simplified Cowardin vegetated classes present, listed in #10 above):

Existing # of Cowardin vegetated classes in AA	Rating
≥3 classes; or 2 classes if 1 is forested	ΠH
2 classes; or 1 class if forested	ХM
1 class, and humans do not prevent establishment of additional classes	□ M
1 class, and humans limit establishment of additional classes	

14A. Habitat for Federally Listed or Candidate Threatened or Endangered Plants or Animals or Other Species of Concern: i., AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species) 🖾 D 🔄 S species: Steller's eider (T),

Secondary habitat (list species)

D XS species: Polar Bear (T), Spectacled Eider

Incidental habitat (list species) None or unknown

 $\Box \Box \Box (T)$

S species:

ii. Rating (use the conclusions from 14A.i. above and the matrix below to arrive at [check] the functional points and rating):

Highest Habitat Level	doc/ primary	sus/ primary	doc/ secondary	sus/ secondary	doc/ incidental	sus/ incidental	None
One or more of the species listed in 14A.i. is a federally Listed or Candidate Threatened or Endangered Species	🔀 1H	.9Н	□ .8M	□.7M	□.3L	□.1L	🗌 OL
Species listed 14A.i. are all "Other Species of Concern" (i.e., not listed under the Endangered Species Act)	.8M	□.7M	.6M	□.5M	□.2L	□.1L	🖾 OL

Sources for documented or suspected use (e.g., observations, records, etc): Two threatened sea duck species, Steller's Eider (Polysticta stelleri) and Spectacled Eider (Somateria fischeri), are present in the area during the breeding season (ABR Report, BEO Master Plan 2013, Barrow Comprehensive Plan 2014). A Stellar's Eider was documented in palustrine flats within the AA (ALCC 2012 from ABR Baseline Assessment, Appendix C). Based on expected habitat use (see ABR report), both eider species are expected to use palustrine flats at some point in their life cycle. The AA is within the 2010 Polar Bear critical habitat zone (although it is under review).

iii. Final Score and Rating: 1.0H Enter on the summary page on the Habitat for Federally Listed Species row.

14B. General Wildlife Support Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

[check]):

Minimal (based on any of the following

interviews with local biologists with

few or no wildlife observations

□ sparse adjacent upland food

knowledge of the AA

☐ little to no wildlife sign

- observations of abundant wildlife #s or high species diversity (during any period) during peak use periods X abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- presence of extremely limiting habitat features not available in the surrounding area sources

interviews with local biologists with knowledge of the AA or its habitat type

Moderate (based on any of the following [check]):

observations of scattered wildlife groups or individuals or relatively few species during peak periods

common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.

upland food sources exist in moderate quantity

interviews with local biologists with knowledge of the AA or its habitat type

ii. Wildlife habitat features Working from top to bottom, check appropriate AA attributes in the matrix to arrive at the rating. Structural diversity is from question #13.

For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent age of the AA (see #10).

Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent. See instructions for further definitions of these terms.

Structural diversity (from #13)		н										Mode	erate				Low			
Class cover distribution (all vegetated classes)		Even			Even Uneven Even U			Uneven Even												
Longest duration of surface water in ≥ 10% of AA, or immediately abutting the AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i & 12ii)	ΠE	ΠE	Ε	Πн	ΠE	Ε	□н	Пн	ΠE	⊠н	□н	□м	Ε	□н	□м	□м	Ε	Πн	□м	□м
<i>Moderate</i> disturbance at AA (see #12i & 12ii)	Πн	□н	Πн	ПН	□н	Пн	□н	ШМ	ПН	ПН	ШΜ	ШМ	ΠН	ПМ	□м	ΓL	Н	M	ΠL	ΠL
<i>High</i> disturbance at AA (see #12i & 12ii)	M	M	□М	٦L	Μ	□м	L	L	Μ	□м	ΠL	L	□М	L	ΠL	٦L	٦L	٦L	ΠL	ΠL

iii. Rating (use the conclusions from i. and ii. above and the matrix below to arrive at [check] the functional points and rating)

		Wildlife habitat feat	tures rating (ii)					
Evidence of wildlife use (i)	Exceptional	Exceptional High Mode						
Substantial	🗌 1E	.9H	□ .8H	□ .7M				
Moderate	□ .9H	□.7M	□ .5M	□ .3L				
Minimal	.6M	□ .4M	.2L	🗌 .1L				

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iv. Final Score and Rating: <u>0.9H</u> Enter on the summary page on the General Wildlife Support row. Comments:

The AA evaluation included evidence of use by loons, goose, swan, grazers, fox, and other species. In addition, the ABR Baseline Assessment included a review of wildlife use by wetland functional class for the region including the AA.

14C. General Fish Support Rating: (Assess this function if any part of the AA (including the waterbody part of a wetland AA) is used by fish or the existing situation is "correctable" such that the AA could be used by fish. If the AA is not used by fish, fish use is not restorable, or is not desired from a management perspective, then check XA here and proceed to 14D.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check] the functional points and rating)

Duration of surface water in AA	Perma	anent / Peren	nial	Seas	onal / Intermi	ttent	Tempo	orary / Ephem	neral
Aquatic hiding / resting / escape cover in waterbody (Table 3 in manual)	Optimal	Adequate	Poor	Optimal	Adequate	Poor	Optimal	Adequate	Poor
Anadromous salmon species	🗌 1E	□.8H	□.6M	□.9H	□.7M	□.5M	□.7M	□.5M	□.3L
Resident and non- salmon sport and subsistence species	□.9H	□.7M	□.5M	□.8H	□.6M	□.4M	□.6M	□.4M	□.2L
Other resident species	□.8H	□.6M	□.4M	□.7M	□.5M	□.3L	□.5M	□.3L	□.1L

ii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA precluded or substantially reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the current Alaska Department of Environmental Conservation list of Category 5 / Section 303(d) Impaired Waterbodies (unless its impaired uses are named and aquatic life is not listed as impaired)?

Y N If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

b) Do noxious or invasive plant species or invasive fish species (see Appendices F and G) occur in the AA?

Y N If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

iii. Final Score and Rating: <u>N/A</u> Enter on the summary page on the General Fish Support row. **Comments:**

14D. Water Storage: (Applies to wetlands that flood or pond from overbank flooding, precipitation, or overland flow from uplands. If no wetlands in the AA are subject to inundation or ponding, check \Box **NA** here and proceed to 14E.)

i. Rating

Estimate the variation in the water volume stored in the **wetland** portion of the AA **that experiences surface ponding or flooding** during the typical year, between break-up and freeze-up. First, identify the part of the AA that is both wetland and has surface water sometime between breakup and freezeup (the "flooded wetland"). Estimate its area in acres: **1192.87** acres = A. Second, estimate the range in that flooded wetland's water surface elevation between its lowest and highest elevation during the unfrozen period, in feet. Call this D for depth: **0.5** feet = D. For example, if the water table is typically one foot below the ground surface during the driest part of summer, and is typically 6 inches above the surface following breakup, the range is 18 inches, or 1.5 feet. Consider evidence such as water marks, staining on vegetation or rocks, drift lines, and the depth to the water table in your soil pit. Consider also the elevation of the wetland surface relative to the elevation of the water surface in an adjacent stream (i.e., does the channel overflow its banks into the wetland?). During a flood, the depth of water over a stream channel is likely to be double its depth when the stream is full to its banks. Consider the area the stream would flood when the water is that deep. Multiply the range in the flooded wetland's water surface elevation (D) times the area (A) to estimate the maximum storage volume

in acre-feet. D 0.5 feet XA 1400 acres = 700

acre-feet. Use this storage volume estimate in the matrix below.

Next, determine the portion of the flooded wetland that is forested, shrub-dominated, or is neither of those but is dominated by hummocks or tussocks at least one foot in height:

% of AA that experiences water surface fluctuation that is forested or scrub/shrub <u>5</u>%

plus the additional % of the flooded wetland that is hummocky 15 %

= 20 % of flooded wetland with water-slowing roughness. Use this percentage in the second row of the matrix below.

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Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating.

Estimated maximum acre-feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding		>5 acre-fe	et	1	to 5 acre-f	eet	<1 acre-foot			
% of flooded wetland classified as forested or scrub/shrub or dominated by hummocks > 1 foot tall	>75%	25-75%	<25%	>75%	25-75%	<25%	>75%	25-75%	<25%	
AA contains no outlet or restricted outlet	□ 1H	□.9H	M6. 🛛	□ .8H	□.7M	□.5M	□.4M	□.3L	□.2L	
AA contains unrestricted outlet	.9H	□.8H	□.5M	7M	□.6M	□.4M	□.3L	□.2L	□.1L	

ii. Final Score and Rating: <u>0.6M</u> Enter on the summary page on the Water Storage row.

Comments:

Wetlands within AA are subject to seasonal or irregular inundation and likely store water during those periods. There were no channelized outlets observed, but sheet flow to and from surrounding wetlands is likely.

iii. Potential Property Protection

Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? □Y⊠ N (This information will be used later.) Comments:

14E. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are, or with the planned project will be, subject to such input, check \square NA here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	proposed levels o level substar sources	future land us f sediments, i s such that ot tially impaired s of nutrients hication are p	se) has pote nutrients, or her function d. Minor sec or toxicants,	s are not limentation, or signs of	of Impaired W surrounding lar high levels toxicants su substantially in sources of nut	Waterbody is on Alaska's Section 303(d) Li of Impaired Waterbodies or AA receives of surrounding land use has potential to delive high levels of sediments, nutrients, or toxicants such that other functions are substantially impaired. Major sedimentation sources of nutrients or toxicants, unnatura turbidity, or signs of eutrophication are present. ≥ 70% < 70 Yes No Yes				
% cover of vegetation in AA	\geq	70%	<	70%	≥ 70°	%	< 7	0%		
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No		
AA contains no or restricted outlet	🕅 1H	□.8H	□.7M	□ .5M	□.5M	□.4M	□.3L	□.2L		
AA contains unrestricted outlet	□.9H	□.7M	□.6M	□ .4M	.4M	.3L	.2L	.1L		

ii. Final Score and Rating: 1.0H Enter on the summary page on the Sediment/Nutrient/Toxicant Retention row.

Comments:

AA likely receives sediments, nutrients, and/or toxicants from adjacent areas. ABR Baseline Report contains details on vegetation and ponding observed. Vegetation percentage includes bryophytes.

14F. Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or manmade drainage, or on the shoreline of a standing water body which is subject to wave action. If 14F does not apply, check

NAhere and proceed to 14G.)

For the <u>wetland</u> area subjected	Duration of sur	face water adjacent to rooted vege	Temporary / Ephemeral					
to erosive forces, % cover of species with deep, soil-binding root masses	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral					
≥65%	🗌 1H	□ .9H	□ .7M					
35-64%	7M	.6M	□ .5M					
< 35%	□ .3L	□ .2L	□.1L					

ii. Final Score and Rating: <u>N/A</u> Enter on the summary page on the Sediment/Shoreline Stabilization row.

Comments:

14G. Production Export/Terrestrial and Aquatic Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings from 14B and 14C [check appropriate box in matrix])

General Fish Habitat	General	Wildlife Habitat Rati	ng (14B.iii.)
Rating (14C.iii.)	E/H	М	L
E/H	×н	ΠH	M
М	ΠH	M	🗆 M
L	□ M	M	
NA	M	□ M	

ii. Rating Working from top to bottom, use the matrix below to arrive at the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14G.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as defined under #10 above, and A = "absent")

Α		Vegetate	ed comp	onent >	5 acres	5	V	egetate	ed com	ponent	1-5 acre	es	Vegetated component <1 acre					
В	High Modera		erate	L	ow	Hi	gh	Mod	erate	Lo	w	Hi	High		Moderate		ow 🛛	
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	🗌 1H	□.7M	H8. 🗌	□ .5M	□ .6M	□.4M	□ .9H	□ .6M	□ .7M		□ .5M	□.3L	□ .8H	□ .6M	□ .6M	4M	□.3L	□.2L
S/I	□.9H	M6. 🛛	□.7M	□ .4M	□ .5M	□.3L	□ .8H	□ .5M	□ .6M	□.3L	□ .4M	□.2L	□ .7M	□ .5M	□ .5M	□.3L	🗌 .3L	□.2L
T/E or A	□.8H	□.5M	.6M	□.3L	□ .4M	2L	□.7M	□ .4M	□ .5M	□.2L	□.3L	□.1L	□ .6M	□ .4M	□ .4M	□.2L	□.2L	□.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.)

A **Vegetated Upland Buffer** is an area with \ge 30% plant cover, \le 2% noxious or invasive plant cover, and that is not subjected to periodic mowing or clearing (unless for weed control).

a) Is there an average ≥50-foot-wide vegetated upland buffer around ≥75% of the AA circumference?

Y N If yes, add 0.1 to the score in **14G.ii**. above and adjust the rating accordingly:

iv. Final Score and Rating: 0.7M Enter on the summary page on the Production Export row.

Comments: Fish rating was N/A, assumed 14Gi was H based on 14Biii. There are no uplands present around the AA, so 14Giii was answered based on the vegetated wetland buffer of depressional wetlands around the majority of the AA.

14H. Groundwater Discharge/Recharge: (Check the appropriate indicators in i. and ii. below.)

	i. Discharge Indicators	ii. Recharge Indicators 🛛 🗌 (NA for fringe wetlands)
	The AA is a slope wetland (HGM type)	Permeable substrate present without underlying impeding layer
	Springs or seeps are known or observed	Wetland contains inlet but no outlet Stream is a known 'losing' stream; discharge decreases
Ш	Vegetation growing during dormant season	downstream
	Wetland occurs at the toe of a natural slope	Other:
	AA permanently flooded during dry periods	
	Wetland contains an outlet, but no inlet	
	Other:	

iii. Rating (use the information from i. and ii. above and the table below to arrive at [check] the functional points and rating)

Criteria			lands FROM GROU THAT IS RECHAR(ER SYSTEM				
	P/P	S/I	T/E	None			
Groundwater discharge or recharge indicators exist	🗆 1H	□ .7M	□.4M	□.1L			
Permafrost underlies the wetland or insufficient information exists	I I						

iv. Final Score and Rating: <u>N/A</u> Enter on the summary page on the Groundwater Discharge/Recharge row. Comments:

There is permafrost present.

14I. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	wetla sprin forested associat	tion listed as	ns, bogs,	irreplace structura OR con listed a	does not co able wetland al diversity (tains plant a s S3, G3, S? KNHP (App	d types and #13) is high ssociation ?, or G? by	AA does not contain irreplaceable wetland types and structural diversity (#13) is low to moderate (Appendix J)			
Estimated relative abundance of wetland types (from 11)	rare	common	abundant	rare	common	abundant	rare	common	abundant	
Low disturbance at AA (from 12i and ii)	🗌 1H	6M. 🗌	□ .5M	□.8H	□.5M	□.4M	□.7M	⊠.4M	□.3L	
Moderate disturbance at AA (from 12i and ii)	□.9H	□.5M	□.4M	□.7M	□.4M	□.3L	□.6M	□.3L	□.2L	
<u>High</u> disturbance at AA (from12i and ii)	□.7M	□.3L	□.2L	□ .5M	□.2L	□.1L	□.4M	□.1L	□.1L	

ii. Final Score and Rating: 0.4M Enter on the summary page on the Uniqueness row.

Comments:

14J. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity) **i. Is the AA a known or potential recreation or education site:** (check) $\boxtimes Y \square N$ (if 'Yes' continue with the evaluation; if 'No'

then check \square **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA:

 \square Educational/scientific study \square Consumptive recreation \square Non-consumptive recreation \square Other <u>Subsistence Use</u> **iii. Rating** (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	□.2H	🗌 .15H
Private ownership with general public access (no permission required)	🛛 .15H	□.1M
Private or public ownership without general public access, or requiring permission for public access	□ .1M	.05L

iv. Final Score and Rating: <u>0.15H</u> Enter on the summary page on the Recreation/Education Potential row. Comments:

Property is currently under private ownership but does not appear to prohibit subsistence use by the public. ATV trails occur occasionally near the AA. Scientific use requires a permit.

General Site Notes:

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with a check
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	Н	1.0	1.0		
B. General Wildlife Support	Н	0.9	1.0		\boxtimes
C. General Fish Support	N/A	N/A	1.0		
D. Water Storage	М	0.6	1.0		
E. Sediment/Nutrient/Toxicant Removal	Н	1.0	1.0		\boxtimes
F. Sediment/Shoreline Stabilization	N/A	N/A	1.0		
G. Production Export/Food Chain Support	М	0.7	1.0		\boxtimes
H. Groundwater Discharge/Recharge	N/A	N/A	N/A		
I. Uniqueness	М	0.4	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15			
Totals:		4.75	6.0		
Percent of Possible Score (actual points divided by possible points)		79%			

AA1 - Estuarine Wetlands

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2

Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for Uniqueness; or

Score of 0.9 or 1 functional point for Water Storage and answer to Question 14Dii is "yes"; or

Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score \geq 70% (round to nearest whole number); or

Percent of possible score \geq 50% and 6th level hydrologic unit has already experienced \geq 15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4

Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

- Score of 0.9 or 1 functional point for General Wildlife Support; or
- Score of 0.6 to 0.8 functional point for General Fish Support; or
- Score of 0.8 functional point for Uniqueness; or

Score 0.7 or 0.8 functional point for Water Storage **and** answer to Question 14Dii is "yes"; **or**

□ Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied

Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3

- Vegetated <u>wetland</u> component of AA < 1 acre (do <u>not</u> include upland vegetated buffer); and
- Score of 0.5 or lower for Uniqueness; and
- General Wildlife Support is 0.4 or lower; **and**
- General Fish Support score is 0.3 or lower; and

If answer to 14Dii is "no", score for Water Storage is 0.2, 0.1, or NA; and

- □ Is not rated "High" for any function or service; **and**
- Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (check appropriate category based on the criteria outlined above)

Category: 21 2 3 4

Appendix A Wetland Assessment Data Form

<u>Digital Form</u> – Use only if completing on a computer. Otherwise, use form in AKWAM manual.

Use this form to assess areas that are primarily wetlands (versus waterbodies). For waterbodies, use the Waterbody Categorization Form.

1. Project name:	2. Assessment Area #(s): AA2 - Palustrine Depressional
 Evaluation date: Mo. 07 Day <u>30-31</u> Yr. 2015 Evaluator(s) and affiliation: <u>SLI, EKJ: ABR</u> Purpose of evaluation: 	
 Wetland/waterbody potentially affected by a proposed project Mitigation wetlands; post-construction 6. Wetland location(s): Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; S. 1; Umia 	Other <u>Mitigation wetlands; preservation; Current/with</u> project condition
Lat. (dec. deg.): 71.2823 Long.: -156.5088 Datum: NAD 83	Nearest community: Utqiagvik, AK
 Watershed: <u>Elson Lagoon - Frontal Beaufort Sea (12th level HUC</u> Ecoregion (from USCOE 2007): 7. Identifying numbers of related data: wetland determination form photos <u>see ABR Baseline Assessment Appendices A and C</u> GPS w Map (#) showing AA: <u>Figure 6</u> (closely follow the User's Manual ins Briefly describe the features that define the limits of the AA (e.g tide elevation): AA2 consists of NWI class palustrine depressional wetlands For the purposes of AKWAM, the boundaries of the AA are co the project boundary because the southern boundary it is bout types. 	as BEO-24, BEO-25, BEO-26, BEO-27, BEO-29 raypoint # other structions for identifying the AA) ., tributary, wetland/upland boundary, extreme low (PEM1F), as part of a larger wetland complex. onsidered to be almost all within the edges of
8. Wetland size (total acres, not just AA): <u>1000+</u> acres (visually estimate	ed) or acres (measured,e.g., in GIS)
9. Assessment area (AA) size: acres (visually estimated	d) or approximately <u>400</u> acres (measured)
Note: Waterbodies were not considered in this AA even when a	djacent to wetlands because there was not direct
connection. 328.63 acres of this AA are within the project site. Acreage of the AA MINUS the part that is waterbody that will be separate	rately assessed using the waterbody form: 400 acres of wetland in

Acreage of the AA MINUS the part that is waterbody that will be separately assessed using the waterbody form: 400 acres of wetland in AA

10. Classification of Wetland and Waterbody in the Wetlland AA:

Class (Cowardin)	Water Regime (Cowardin)	Modifier (if any; Cowardin)	% of AA
EM - PEM1F	S/I		100%

HGM Class (Brinson)	% of AA
D	100%
	%
	%
	%

HGM Classes: Riverine (R),

Lacustrine Fringe (LF)

Depressional (D), Slope (S), Flat (F),

Abbreviations:

Cowardin Classes: Forested Wetland (FO), Scrub-Shrub Wetland (SS), Emergent Wetland (EM), Moss-lichen Wetland (ML), Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes: Permanent/Perennial (P/P),

Seasonal/Intermittent (S/I), Temporary/Ephemeral/Saturated (T/E)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (**F**), Artificial (**A**), Beaver-modified (**B**)

11. Estimated relative abundance of similar wetlands within the same 6th level hydrologic unit subregion (see definitions in user's manual):

(check one) Unknown

Rare Common Abundant

What information sources did you use for this estimate?

Estimate based on visual observation of palustrine depressional wetlands within HUC.

12. General condition of AA:

i. Disturbance (see user's manual for descriptions of disturbance levels; check appropriate box):

Conditions adjacent to AA	Predominant conditions adjacent to (within 500 feet of) the AA, <u>plus</u> any area that drains into the AA							
Conditions within AA	Adjacent land is in a natural state	Adjacent land has experienced minimal or minor disturbance	Adjacent land is substantially disturbed					
AA is in a natural state	Iow disturbance	low disturbance	moderate disturbance					
AA has experienced minimal or minor disturbance	moderate disturbance	moderate disturbance	high disturbance					
AA is substantially disturbed	☐ high disturbance	high disturbance	high disturbance					

Describe the disturbance within the AA (type, age, intensity, source of disturbance, location): Very isolated instances of minimal disturbance found, like small equipment or a few ATV tracks, mostly outside of this AA. Considered to be essentially natural.

high disturbance

ii. Consider the 6th level HU containing the AA again. If you estimate that more than 10% of the land in the 6th level HU is disturbed, check

here \Box , and choose (below) the disturbance level that is one level higher:

□ low disturbance □ moderate disturbance

iii. List anynoxious or invasive plant or animal species in the AAor surrounding lands (specifywhich are in the AA): *None.*

iv. Brieflydescribe the AAand surrounding land use and habitat types (dominant species, water source, topography, approximate slope, inlets and outlets, land use, relationship to other AAs, adjacent vegetation types and land uses):

AA1 consists of NWI class palustrine (PEM1F), depressional (HGM) semipermanently flooded graminoid (sedge) meadow tundra with small pools of open water, part of a larger wetland complex with flat wetlands and larger open water ponds and lakes. Semipermanently Flooded Wet Graminoid Meadow is the most common functional class, which has low centered polygons supporting obligate wet sedge with some small open bodies of standing water. The second most common functional class is Wet Graminoid Meadow and Shallow Open Water Complex, which is similar in structure but with more pronounced shallow open water ponds. Both occur within low-lying areas around lakes/ponds or in a drained lake basin to the east of East Twin Lake. Typical graminoid species include Carex aquatilis and Eriophorum angustifolium.

13. Structural Diversity of AA (based on number of simplified Cowardin vegetated classes present, listed in #10 above):

Existing # of Cowardin vegetated classes in AA	Rating
≥3 classes; or 2 classes if 1 is forested	ПН
2 classes; or 1 class if forested	□ M
1 class, and humans do not prevent establishment of additional classes	ХM
1 class, and humans limit establishment of additional classes	

14A. Habitat for Federally Listed or Candidate Threatened or Endangered Plants or Animals or Other Species of Concern: i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species) 🖾 D 🔤 S species: Steller's eider (T),

Secondary habitat (list species)

D S species: Polar Bear (T), Spectacled Eider

Incidental habitat (list species) None or unknown

D D (T) S species: ii. Rating (use the conclusions from 14A.i. above and the matrix below to arrive at [check] the functional points and rating):

Highest Habitat Level	doc/ primary	sus/ primary	doc/ secondary	sus/ secondary	doc/ incidental	sus/ incidental	None
One or more of the species listed in 14A.i. is a federally Listed or Candidate Threatened or Endangered Species	🔀 1H	.9Н	□ .8M	□.7M	□.3L	□.1L	🗌 OL
Species listed 14A.i. are all "Other Species of Concern" (i.e., not listed under the Endangered Species Act)	.8M	□.7M	□.6M	□.5M	□.2L	🗌 .1L	🖾 OL

Sources for documented or suspected use (e.g., observations, records, etc): Two threatened sea duck species, Steller's Eider (Polysticta stelleri) and Spectacled Eider (Somateria fischeri), are present in the area during the breeding season (ABR Report, BEO Master Plan 2013, Barrow Comprehensive Plan 2014). A Stellar's Eider was documented in palustrine depressional wetlands within the AA (ALCC 2012 from ABR Baseline Assessment, Appendix C). Based on expected habitat use (see ABR report), both eider species are expected to use palustrine depressional wetlands at some point in their life cycle. The AA is within the 2010 Polar Bear critical habitat zone (although it is under review).

iii. Final Score and Rating: 1.0H Enter on the summary page on the Habitat for Federally Listed Species row.

14B. General Wildlife Support Rating:

i. Evidence of overall wildlife use in the AA(check substantial, moderate, or low based on supporting evidence):

Sul	ostantial (based on any of the following [check]):	Minimal (based on any of the following
	[check]):	
	observations of abundant wildlife #s or high species diversity (during any period) during peak use periods	few or no wildlife observations
	abundant wildlife sign such as scat, tracks, nest structures, game trails, etc. presence of extremely limiting habitat features not available in the surrounding area	 little to no wildlife sign sparse adjacent upland food
_	sources	

interviews with local biologists with knowledge of the AA or its habitat type

Moderate (based on any of the following [check]):

observations of scattered wildlife groups or individuals or relatively few species during peak periods

common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.

upland food sources exist in moderate quantity

interviews with local biologists with knowledge of the AA or its habitat type

ii. Wildlife habitat features Working from top to bottom, check appropriate AA attributes in the matrix to arrive at the rating. Structural diversity is from question #13.

For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent age of the AA (see #10).

interviews with local biologists with knowledge of the AA

Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent. See instructions for further definitions of these terms.

Structural diversity (from #13)	High					Moderate						Low								
Class cover distribution (all vegetated classes)	Even Uneven			ven		Even			Uneven				Even							
Longest duration of surface water in ≥ 10% of AA, or immediately abutting the AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i & 12ii)	ΠE	ΠE	ΠE	Пн	ΠE	Ε	□н	□н	ΠE	Пн	ПН	□м	ΠE	⊠н	□м	□м	Ε	Πн	□м	□м
<i>Moderate</i> disturbance at AA (see #12i & 12ii)	□н	□н	ПН	□н	□н	□н	□н	□м	ПН	ПН	□М	□м	ПН	□м	□м	ΠL	Πн	М	٦L	ΠL
High disturbance at AA (see #12i & 12ii)	M	M	M	L	M	М	ΠL	٦L	M	□М	ΠL	ΠL	Μ	٦L	ΠL	ΠL	٦L	٦L	ΠL	ΠL

iii. Rating (use the conclusions from i. and ii. above and the matrix below to arrive at [check] the functional points and rating)

		Wildlife habitat features rating (ii)										
Evidence of wildlife use (i)	Exceptional	High	Moderate	Low								
Substantial	🗌 1E	X .9H	□ .8H	□.7M								
Moderate	□ .9H	□.7M	□ .5M	🗌 .3L								
Minimal	.6M	□ .4M	.2L	🗌 .1L								

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iv. Final Score and Rating: <u>0.9H</u> Enter on the summary page on the General Wildlife Support row. Comments:

The AA evaluation included evidence of use by loons, goose, swan, grazers, fox, and other species. In addition, the ABR Baseline Assessment included a review of wildlife use by wetland functional class for the region including the AA.

14C. General Fish Support Rating: (Assess this function if any part of the AA (including the waterbody part of a wetland AA) is used by fish or the existing situation is "correctable" such that the AA could be used by fish. If the AA is not used by fish, fish use is not restorable, or is not desired from a management perspective, then check \Box NA here and proceed to 14D.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check] the functional points and rating)

-										
Duration of surface water in AA	Perm	anent / Peren	nial	Seas	onal / Intermi	ttent	Temporary / Ephemeral			
Aquatic hiding / resting / escape cover in waterbody (Table 3 in manual)	Optimal	Adequate	Poor	Optimal	Adequate	Poor	Optimal	Adequate	Poor	
Anadromous salmon species	🗌 1E	□.8H	□.6M	□.9H	□.7M	□.5M	□.7M	□.5M	□.3L	
Resident and non- salmon sport and subsistence species	□.9H	□.7M	□.5M	□.8H	□.6M	□.4M	□.6M	□.4M	□.2L	
Other resident species	□ .8H	□.6M	□.4M	X .7M	□.5M	□.3L	□.5M	□.3L	□.1L	

ii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA precluded or substantially reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the current Alaska Department of Environmental Conservation list of Category 5 / Section 303(d) Impaired Waterbodies (unless its impaired uses are named and aquatic life is not listed as impaired)?

 $\square Y \square N$ If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

b) Do noxious or invasive plant species or invasive fish species (see Appendices F and G) occur in the AA?

Y XN If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

iii. Final Score and Rating: 0.7M Enter on the summary page on the General Fish Support row.

Comments: Fish were not observed during the Baseline Assessment, but are assumed to be present during the growing season in the Wet Graminoid Meadow and Shallow Open Water Complex, where there are small seasonal ponds present. East Twin Lake and some other mapped ponds could provide a source of fish when water levels are sufficient to allow movement between the larger waterbodies and the wetland-open water complex.

14D. Water Storage: (Applies to wetlands that flood or pond from overbank flooding, precipitation, or overland flow from uplands. If no wetlands in the AA are subject to inundation or ponding, check \Box **NA** here and proceed to 14E.)

i. Rating

Estimate the variation in the water volume stored in the **wetland** portion of the AA **that experiences surface ponding or flooding** during the typical year, between break-up and freeze-up. First, identify the part of the AA that is both wetland and has surface water

sometime between breakup and freezeup (the "flooded wetland"). Estimate its area in acres: <u>368</u> acres = A. Second, estimate the range in that flooded wetland's water surface elevation between its lowest and highest elevation during the unfrozen period, in feet. Call this D for depth: <u>1.0</u> feet = D. For example, if the water table is typically one foot below the ground surface during the driest part of summer, and is typically 6 inches above the surface following breakup, the range is 18 inches, or 1.5 feet. Consider evidence such as water marks, staining on vegetation or rocks, drift lines, and the depth to the water table in your soil pit. Consider also the elevation of the wetland surface relative to the elevation of the water surface in an adjacent stream (i.e., does the channel overflow its banks into the wetland?). During a flood, the depth of water over a stream channel is likely to be double its depth when the stream is full to its banks. Consider the area the stream would flood when the water is that deep. Multiply the range in the flooded wetland's water surface elevation (D) times the area (A) to estimate the maximum storage volume

in acre-feet. D 1.0 feet XA 400 acres = 400

acre-feet. Use this storage volume estimate in the matrix below.

Next, determine the portion of the flooded wetland that is forested, shrub-dominated, or is neither of those but is dominated by hummocks or tussocks at least one foot in height:

% of AA that experiences water surface fluctuation that is forested or scrub/shrub $_$ 0 $_\%$

plus the additional % of the flooded wetland that is hummocky 30 %

= <u>30</u> % of flooded wetland with water-slowing roughness. Use this percentage in the second row of the matrix below.

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Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating.

Estimated maximum acre-feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding		>5 acre-fe	et	1	to 5 acre-f	eet	<1	l acre-foot	
% of flooded wetland classified as forested or scrub/shrub or dominated by hummocks > 1 foot tall	>75%	25-75%	<25%	>75%	25-75%	<25%	>75%	25-75%	<25%
AA contains no outlet or restricted outlet	□ 1H	N9. 🛛	□.6M	□ .8H	□.7M	□.5M	□.4M	□.3L	□.2L
AA contains unrestricted outlet	.9H	□.8H	□.5M	7M	□.6M	□.4M	□.3L	□.2L	□.1L

ii. Final Score and Rating: 0.9H Enter on the summary page on the Water Storage row.

Comments:

Wetlands within AA are subject to seasonal inundation and ponded water is present during those periods. There were no channelized outlets observed, but sheet flow to and from surrounding wetlands is likely.

iii. Potential PropertyProtection Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? YX N (This information will be used later.) Comments:

14E. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are, or with the planned project will be, subject to such input, check **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	proposed levels o level substar sources	future land us f sediments, i s such that ot tially impaired s of nutrients hication are p	se) has pote nutrients, or her function d. Minor sec or toxicants,	s are not limentation, or signs of	Waterbody is on Alaska's Section 303(d) List of Impaired Waterbodies or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or toxicants such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, unnatural turbidity, or signs of eutrophication are present.					
% cover of vegetation in AA	\geq	70%	<	70%	≥ 70°	%	< 7	'0%		
Evidence of flooding / ponding in AA	Yes	Yes No		No	Yes	No	Yes	No		
AA contains no or restricted outlet	🔀 1H	□.8H	.7M .5M		□ .5M	□.4M	□.3L	□.2L		
AA contains unrestricted outlet	□.9H	□.7M	□.6M	□.4M	□ .4M	.3L	.2L	.1L		

ii. Final Score and Rating: 1.0H Enter on the summary page on the Sediment/Nutrient/Toxicant Retention row.

Comments: AA likely receives sediments, nutrients, and/or toxicants from adjacent areas. ABR Baseline Report contains details on vegetation and ponding observed. Vegetation percentage includes bryophytes.

14F. Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or manmade drainage, or on the shoreline of a standing water body which is subject to wave action. If 14F does not apply, check 📉

NAhere and proceed to 14G.)

For the <u>wetland</u> area subjected	Duration of surface water adjacent to rooted vegetation in the AA							
to erosive forces, % cover of species with deep, soil-binding root masses	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral					
≥65%	🗌 1H	□ .9H	7M					
35-64%	7M	.6M	□ .5M					
< 35%	□ .3L	□ .2L	□.1L					

ii. Final Score and Rating: N/A Enter on the summary page on the Sediment/Shoreline Stabilization row.

Comments: Ponds within the AA are too small to support wave action, and the AA wetlands do not have a direct connection with the adjacent East Twin Lake that would support shoreline stabilization. 14G. Production Export/Terrestrial and Aquatic Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings from 14B and 14C [check appropriate box in matrix])

General Fish Habitat	General Wildlife Habitat Rating (14B.iii.)							
Rating (14C.iii.)	E/H	М	L					
E/H	ΠH	ΠH	M					
М	ХН	M	M					
L	□ M	M						
NA	M	□ M						

ii. Rating Working from top to bottom, use the matrix below to arrive at the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14G.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as defined under #10 above, and A = "absent")

Α		Vegetate	ed comp	onent >	5 acres	5	V	Vegetated component 1-5 acres					Vegetated component <1 acre						
В	Hi	gh	Mod	erate	L	ow	Hi	gh	Mod	erate	Lo	w	Hi	gh	Mod	erate	Lo	ow 🛛	
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
P/P	🗌 1H	□.7M	□.8H	□ .5M	□ .6M	□.4M	□ .9H	□ .6M	□ .7M	4M	□ .5M	□.3L	□ .8H	□ .6M	□ .6M	4M	□.3L	□.2L	
S/I	□.9H	M6. 🗵	□.7M	□ .4M	□ .5M	□.3L	□ .8H	□ .5M	□ .6M	□.3L	□ .4M	□.2L	□ .7M	□ .5M	□ .5M	□.3L	🗌 .3L	□.2L	
T/E or A	□.8H	□.5M	.6M	□.3L	□ .4M	2L	□.7M	□ .4M	□ .5M	□.2L	□.3L	□.1L	□ .6M	□ .4M	□ .4M	□.2L	□.2L	□.1L	

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.)

A **Vegetated Upland Buffer** is an area with \ge 30% plant cover, \le 2% noxious or invasive plant cover, and that is not subjected to periodic mowing or clearing (unless for weed control).

a) Is there an average ≥50-foot-wide vegetated upland buffer around ≥75% of the AA circumference?

 $\square Y \square N$ If yes, add 0.1 to the score in **14G.ii**. above and adjust the rating accordingly:

iv. Final Score and Rating: 0.7M Enter on the summary page on the Production Export row.

Comments: There are no uplands present around the AA, so 14Giii was answered based on the vegetated wetland buffer of palustrine flat wetlands around the majority of the AA.

14H. Groundwater Discharge/Recharge: (Check the appropriate indicators in i. and ii. below.)

i.	Discharge	Indicators

- The AA is a slope wetland (HGM type)
- $\hfill\square$ Springs or seeps are known or observed
- Vegetation growing during dormant season
- □ Wetland occurs at the toe of a natural slope
- □ AA permanently flooded during dry periods
- □ Wetland contains an outlet, but no inlet
- Other:

ii. Recharge Indicators (NA for fringe wetlands) Permeable substrate present without underlying impeding layer

- layerWetland contains inlet but no outlet
- Wetland contains inlet but no outlet Stream is a known 'losing' stream; discharge decreases
- downstream
- Other:
- iii. Rating (use the information from i. and ii. above and the table below to arrive at [check] the functional points and rating)

Criteria		Duration of saturation at AA wetlands FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM							
	P/P	S/I	T/E	None					
Groundwater discharge or recharge indicators exist	🗌 1H	□.7M	□.4M	□.1L					
Permafrost underlies the wetland or insufficient information exists	X NA								

iv. Final Score and Rating: <u>N/A</u> Enter on the summary page on the Groundwater Discharge/Recharge row. Comments:

There is permafrost present.

14I. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	wetla sprin forested associat	tion listed as	ns, bogs,	irreplace structura OR con listed a	does not co able wetland al diversity (tains plant a s S3, G3, S? NKNHP (App	d types and #13) is high ssociation ?, or G? by	AA does not contain irreplaceable wetland types and structural diversity (#13) is low to moderate (Appendix J)			
Estimated relative abundance of wetland types (from 11)	rare	rare common abu		rare	common	abundant	rare	common	abundant	
Low disturbance at AA (from 12i and ii)	🗌 1H	6M. 🗌	□ .5M	□.8H	□.5M	□.4M	□.7M	⊠.4M	□.3L	
Moderate disturbance at AA (from 12i and ii)	□.9H	□.5M	□.4M	□.7M	□.4M	□.3L	□.6M	□.3L	□.2L	
<u>High</u> disturbance at AA (from12i and ii)	□.7M	.7M .3L		□ .5M	□.2L	□.1L	□.4M	□.1L	□.1L	

ii. Final Score and Rating: 0.4M Enter on the summary page on the Uniqueness row.

Comments:

14J. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity) **i. Is the AA a known or potential recreation or education site:** (check) $\boxtimes Y \square N$ (if 'Yes' continue with the evaluation; if 'No'

then check \square **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA:

 \square Educational/scientific study \square Consumptive recreation \square Non-consumptive recreation \square Other <u>Subsistence Use</u> **iii. Rating** (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	□.2H	🗌 .15H
Private ownership with general public access (no permission required)	🛛 .15H	□.1M
Private or public ownership without general public access, or requiring permission for public access	□ .1M	.05L

iv. Final Score and Rating: <u>0.15H</u> Enter on the summary page on the Recreation/Education Potential row. Comments:

Property is currently under private ownership but does not appear to prohibit subsistence use by the public. ATV trails occur occasionally near the AA. Scientific use requires a permit.

General Site Notes:

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with a check
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	Н	1.0	1.0		
B. General Wildlife Support	Н	0.9	1.0		\boxtimes
C. General Fish Support	М	0.7	1.0		
D. Water Storage	Н	0.9	1.0		\boxtimes
E. Sediment/Nutrient/Toxicant Removal	Н	1.0	1.0		\boxtimes
F. Sediment/Shoreline Stabilization	N/A	N/A	1.0		
G. Production Export/Food Chain Support	М	0.7	1.0		
H. Groundwater Discharge/Recharge	N/A	N/A	N/A		
I. Uniqueness	М	0.4	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15			
Totals:		5.75	7.0		
Percent of Possible Score (actual points divided by possible points)		82%			

AA1 - Estuarine Wetlands

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2

Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for Uniqueness; or

Score of 0.9 or 1 functional point for Water Storage and answer to Question 14Dii is "yes"; or

Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score \geq 70% (round to nearest whole number); or

Percent of possible score \geq 50% and 6th level hydrologic unit has already experienced \geq 15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4

Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for General Wildlife Support; or

Score of 0.6 to 0.8 functional point for General Fish Support; or

Score of 0.8 functional point for Uniqueness; or

Score 0.7 or 0.8 functional point for Water Storage **and** answer to Question 14Dii is "yes"; **or**

□ Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied

Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3

Vegetated <u>wetland</u> component of AA < 1 acre (do <u>not</u> include upland vegetated buffer); and

Score of 0.5 or lower for Uniqueness; and

General Wildlife Support is 0.4 or lower; **and**

General Fish Support score is 0.3 or lower; **and**

If answer to 14Dii is "no", score for Water Storage is 0.2, 0.1, or NA; and

□ Is not rated "High" for any function or service; **and**

Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (check appropriate category based on the criteria outlined above)

Category: $\square 1$ $\square 2$ $\square 3$ $\square 4$

Appendix A Wetland Assessment Data Form

<u>Digital Form</u> – Use only if completing on a computer. Otherwise, use form in AKWAM manual.

Use this form to assess areas that are primarily wetlands (versus waterbodies). For waterbodies, use the Waterbody Categorization Form.

1. Project name:Charles Etok Edwardsen Mitigation Bank
 3. Evaluation date: Mo. 07 Day 30-31 Yr. 2015 4. Evaluator(s) and affiliation: SLI, EKJ: ABR 5. Purpose of evaluation:
 Wetland/waterbody potentially affected by a proposed project Mitigation wetlands; post-construction Mitigation wetlands; post-construction Mitigation wetlands; preservation; Current/with project condition 6. Wetland location(s): Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; S. 1; Umiat Meridian
Lat. (dec. deg.): 71.2823 Long.: -156.5088 Datum: NAD 83 Nearest community: Utgiaġvik, AK
Watershed: <u>Elson Lagoon - Frontal Beaufort Sea (12th level HUC 190602020105)</u> Ecoregion (from USCOE 2007): 7. Identifying numbers of related data: wetland wetland determination forms <u>BEO-V12, BEO-16, BEO-17</u>
photos see <u>ABR Baseline Assessment Appendices A and C</u> GPS waypoint # other Map (#) showing AA: Figure 6 (closely follow the User's Manual instructions for identifying the AA)
Briefly describe the features that define the limits of the AA (e.g., tributary, wetland/upland boundary, extreme low tide elevation): AA3 consists of three conveyances classified as NWI class riverine intermittent vegetated streambed wetlands (R4SB7). The AA3 includes the adjacent estaurine waterbody (E2USP, see AA5) for the riverine system that is connected to the lkpik Slough and Beaufort Sea to the north; it also includes East and West Twin Lakes (L1UBH, see AA7), which connect to the conveyances in the south. For the purposes of AKWAM, the boundaries of the AA are all (99%) within the edges of the project boundary. This AA is bordered by a larger wetland complex of flat and depressional palustrine wetlands.
8. Wetland size(total acres, not just AA): <u>1000+</u> acres (visually estimated) or acres (measured, e.g., in GIS)
9. Assessment area (AA) size: acres (visually estimated) or 650 acres (measured)
Note: The total AA area includes an estuary to Ilpik Slough and West and East Twin Lakes.

Acreage of the AA MINUS the part that is waterbody that will be separately assessed using the waterbody form: <u>13.87</u> acres of <u>wetland</u> in AA

10. Classification of Wetland and Waterbody in the Wetland AA:

Class (Cowardin)	Water Regime (Cowardin)	Modifier (if any; Cowardin)	% of AA		
EM - R4SB7	S/I		2%		
UN - E2USP	P/P		1%		
UN - L1UBH	P/P		97%		

HGM Class (Brinson)	% of AA
R	2%, 100% vegetated AA
	%
	%
	%

Abbreviations: HGM Classes: Riverine (R), Depressional (D), Slope (S), Flat (F), Lacustrine Fringe (LF)

Cowardin Classes: Forested Wetland (FO), Scrub-Shrub Wetland (SS), Emergent Wetland (EM), Moss-lichen Wetland (ML), Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes: Permanent/Perennial (P/P),

Seasonal/Intermittent (S/I), Temporary/Ephemeral/Saturated (T/E)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (**F**), Artificial (**A**), Beaver-modified (**B**)

11. Estimated relative abundance of similar wetlands within the same 6th level hydrologic unit subregion (see definitions in user's manual):

(check one) Unknown

Common Abundant

What information sources did you use for this estimate? Estimate based on visual observation of riverine wetlands within HUC.

X Rare

12. General condition of AA:

i. Disturbance (see user's manual for descriptions of disturbance levels; check appropriate box):

Conditions adjacent to AA	Predominant conditions adjacent to (within 500 feet of) the AA, <u>plus</u> any area that drains into the AA							
Conditions within AA	Adjacent land is in a natural state	Adjacent land has experienced minimal or minor disturbance	Adjacent land is substantially disturbed					
AA is in a natural state	Iow disturbance	low disturbance	moderate disturbance					
AA has experienced minimal or minor disturbance	moderate disturbance	moderate disturbance	high disturbance					
AA is substantially disturbed	high disturbance	high disturbance	high disturbance					

Describe the disturbance within the AA (type, age, intensity, source of disturbance, location): **Considered to be essentially natural.**

ii. Consider the 6th level HU containing the AA again. If you estimate that more than 10% of the land in the 6th level HU is disturbed, check

here [], and choose (below) the disturbance level that is one level higher:

□ low disturbance □ moderate disturbance

high disturbance

iii. List anynoxious or invasive plant or animal species in the AAor surrounding lands (specifywhich are in the AA): *None.*

iv. Brieflydescribe the AAand surrounding land use and habitat types (dominant species, water source, topography, approximate slope, inlets and outlets, land use, relationship to other AAs, adjacent vegetation types and land uses):

AA3 consists of three conveyances classified as NWI class riverine intermittent vegetated streambed wetlands (R4SB7) and the adjacent estaurine waterbody (E2USP) for the riverine system that is connected to the lkpik Slough and Beaufort Sea to the north. It is part of a larger wetland complex with flat and depressional wetlands and larger open water ponds and lakes. The riverine wetlands are dominated by emergent vegetation such as Carex aquatilis, Eriophorum spp., Arctophila fulva, and Hippuris vulgaris.

13. Structural Diversity of AA (based on number of simplified Cowardin vegetated classes present, listed in #10 above):

Existing # of Cowardin vegetated classes in AA	Rating
≥3 classes; or 2 classes if 1 is forested	ΠH
2 classes; or 1 class if forested	□ M
1 class, and humans do not prevent establishment of additional classes	ХM
1 class, and humans limit establishment of additional classes	L

14A. Habitat for Federally Listed or Candidate Threatened or Endangered Plants or Animals or Other Species of Concern: i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species) 🛛 D 🔄 S species: Steller's eider (T),

Secondary habitat (list species)

 \square D \square S species: <u>Polar B</u>ear (T), Spectacled Eider

Incidental habitat (list species)

None or unknown

• •	
S	species:

ii. Rating (use the conclusions from 14A.i. above and the matrix below to arrive at [check] the functional points and rating):

Highest Habitat Level	doc/ primary	sus/ primary	doc/ secondary	sus/ secondary	doc/ incidental	sus/ incidental	None
One or more of the species listed in 14A.i. is a federally Listed or Candidate Threatened or Endangered Species	🔀 1H	.9Н	□ .8M	□ .7M	□.3L	□.1L	🗌 OL
Species listed 14A.i. are all "Other Species of Concern" (i.e., not listed under the Endangered Species Act)	□.8M	□.7M	□ .6M	□ .5M	□.2L	🗌 .1L	🖾 OL

Sourcesfor documentedor suspected use (e.g., observations, records, etc): Two threatened sea duck species, Steller's Eider (Polysticta stelleri) and Spectacled Eider (Somateria fischeri), are present in the area during the breeding season (ABR Report, BEO Master Plan 2013, Barrow Comprehensive Plan 2014). A Stellar's Eider was documented in open water lakes in AA and in palustrine depressional and flat wetlands near the AA (ALCC 2012 from ABR Baseline Assessment, Appendix C). Based on expected habitat use (see ABR report), both eider species are expected to use habitats within this AA at some point in their life cycle. The AA is within the 2010 Polar Bear critical habitat zone (although it is under review).

iii. Final Score and Rating: 1.0H Enter onthesummary page on the Habitat for Federally Listed Species row.

14B. GeneraWildlifeSupport Rating:

i. Evidence of overall wildlife use in the AA(check substantial, moderate, or lowbased onsupporting evidence):

Substantial (based on any	of the following [check]):
---------------------------	----------------------------

[check]):

Minimal (based on any of the following

interviews with local biologists with

few or no wildlife observations

☐ little to no wildlife sign □ sparse adjacent upland food

knowledge of the AA

- observations of abundant wildlife #s or high species diversity (during any period) during peak use periods abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- presence of extremely limiting habitat features not available in the surrounding area sources

interviews with local biologists with knowledge of the AA or its habitat type

Moderate (based on any of the following [check]):

observations of scattered wildlife groups or individuals or relatively few species during peak periods

common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.

П upland food sources exist in moderate quantity

interviews with local biologists with knowledge of the AA or its habitat type

ii. Wildlife habitat features Working from top to bottom, check appropriate AA attributes in the matrix to arrive at the rating. Structural diversity is from question #13.

For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent age of the AA (see #10).

Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermitter	ι, 1/Ε =
temporary/ephemeral; and A = absent. See instructions for further definitions of these terms.	

Structural diversity (from #13)	High				Moderate							Low								
Class cover distribution (all vegetated classes)	Even				Uneven			Uneven			ven			Une	ven			E	ven	
Longest duration of surface water in ≥ 10% of AA, or immediately abutting the AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i & 12ii)	ΠE	Ε	ΠE	Пн	ΠE	Ε	□н	Пн	ΧE	□н	ПН	□м	ΠE	□н	□м	□м	Ε	Πн	М	□м
<i>Moderate</i> disturbance at AA (see #12i & 12ii)	□н	Πн	ПН	ПΗ	□н	Πн	Πн	□м	ПН	□н	ШМ	□м	ПН	ПМ	□м	ΠL	Н	M	ΓL	ΠL
<i>High</i> disturbance at AA (see #12i & 12ii)	M	М	M	L	M	□м	٦L	ΠL	Μ	Μ	ΠL	ΠL	Μ	٦L	ΠL	ΠL	٦L	٦L	٦L	ΠL

iii. Rating (use the conclusions from i. and ii. above and the matrix below to arrive at [check] the functional points and rating)

		Wildlife habitat features rating (ii)									
Evidence of wildlife use (i)	Exceptional	Exceptional High Moderate Low									
Substantial	🗙 1E	□ .9H	□.8H	□.7M							
Moderate	□ .9H	□.7M	.5M	🗌 .3L							
Minimal	.6M	□ .4M	.2L	🗌 .1L							

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iv. Final Score and Rating: <u>1.0E</u> Enter on the summary page on the GeneraWildlife Support row. Comments:

The ABR Baseline Assessment included a review of wildlife use by wetland functional class for the region including the AA.

14C. General Fish Support Rating: (Assess this function if any part of the AA (including the waterbody part of a wetland AA) is used by fish or the existing situation is "correctable" such that the AA could be used by fish. If the AA is not used by fish, fish use is not restorable, or is not desired from a management perspective, then check \Box **NA** here and proceed to 14D.)

i.	Habitat Quality and Known / Su	spected Fish Species in AA	use matrix to arrive at [checl	[] the functional points and rating)
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Duration of surface water in AA	Perm	Permanent / Perennial			onal / Intermi	ttent	Temporary / Ephemeral			
Aquatic hiding / resting / escape cover in waterbody (Table 3 in manual)	Optimal	Adequate	Poor	Optimal	Adequate	Poor	Optimal	Adequate	Poor	
Anadromous salmon species	🗌 1E	□.8H	□.6M	□.9H	□.7M	□.5M	□.7M	□.5M	□.3L	
Resident and non- salmon sport and subsistence species	□.9H	□.7M	□.5M	□.8H	□.6M	□.4M	□.6M	□.4M	□.2L	
Other resident species	□ .8H	X .6M	□.4M	□.7M	□.5M	□.3L	□.5M	□.3L	□.1L	

ii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA precluded or substantially reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the current Alaska Department of Environmental Conservation list of Category 5 / Section 303(d) Impaired Waterbodies (unless its impaired uses are named and aquatic life is not listed as impaired)?

Y X If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

b) Do noxious or invasive plant species or invasive fish species (see Appendices F and G) occur in the AA?

Y X If yes, reduce the score in 14C.i. by 0.1: (If no, do not change the score.)

iii. Final Score and Rating: 0.6M Enter on the summary page on the General Fish Support row. **Comments: Fish were not observed during the Baseline Assessment, but are assumed to be present in the adjacent estuary and large open water lakes.**

14D. Water Storage: (Applies to wetlands that flood or pond from overbank flooding, precipitation, or overland flow from uplands. If

NAhere and proceed to 14E.)

no wetlands in the AA are subject to inundation or ponding, check

i. Rating

Estimate the variation in the water volume stored in the **wetland** portion of the AA **that experiences surface ponding or flooding** during the typical year, between break-up and freeze-up. First, identify the part of the AA that is both wetland and has surface water sometime between breakup and freezeup (the "flooded wetland"). Estimate its area in acres: <u>13.87</u> acres = A. Second, estimate the range in that flooded wetland's water surface elevation between its lowest and highest elevation during the unfrozen period, in feet. Call this D for depth: <u>0.75</u> feet = D. For example, if the water table is typically one foot below the ground surface during the driest part of summer, and is typically 6 inches above the surface following breakup, the range is 18 inches, or 1.5 feet. Consider evidence such as water marks, staining on vegetation or rocks, drift lines, and the depth to the water table in your soil pit. Consider also the elevation of the wetland surface relative to the elevation of the water surfacein an adjacent stream (i.e., does the channel overflow its banks into the wetland?). During a flood, the depth of water over a stream channel is likely to be double its depth when the stream is full to its banks. Consider the area the stream would flood when the water is that deep. Multiply the range in the flooded wetland's water surface elevation (D) times the area (A) to estimate the maximum storage volume

in acre-feet. D 1.0 feet XA 13.87 acres = 13 acre-feet. Use this storage volume estimate in the matrix below.

Next, determine the portion of the flooded wetland that is forested, shrub-dominated, or is neither of those but is dominated by hummocks or tussocks at least one foot in height:

% of AA that experiences water surface fluctuation that is forested or scrub/shrub $_$ 0 $_\%$

plus the additional % of the flooded wetland that is hummocky 30 %

= <u>30</u> % of flooded wetland with water-slowing roughness. Use this percentage in the second row of the matrix below.

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Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating.

Estimated maximum acre-feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding		>5 acre-fe	et	1	to 5 acre-f	eet	<;	<1 acre-foot	
% of flooded wetland classified as forested or scrub/shrub or dominated by hummocks > 1 foot tall	>75%	25-75%	<25%	>75%	25-75%	<25%	>75%	25-75%	<25%
AA contains no outlet or restricted outlet	□ 1H	□ .9H	□.6M	□ .8H	□.7M	□.5M	□.4M	□.3L	□.2L
AA contains unrestricted outlet	□ .9H	⊠ .8H	□ .5M	7M	□.6M	□.4M	□.3L	□.2L	□.1L

ii. Final Score and Rating: 0.8H Enter on the summary page on the Water Storage row.

Comments:

Flooding from the estuary or large lakes is likely.

iii. Potential Property Protection

Are \geq 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? $\$ YX N (This information will be used later.) **Comments:**

14E. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influxof surface or ground water or direct input. If no wetlands in the AA are, or with the planned project will be subject to such input, check **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	proposed levels o level substar sources	AA receives or surrounding land use (including proposed future land use) has potential to deliver levels of sediments, nutrients, or toxicants at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication are present, or sources are suspected.				Waterbody is on Alaska's Section 303(d) List of Impaired Waterbodies or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or toxicants such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, unnatural turbidity, or signs of eutrophication are present.				
% cover of vegetation in AA	≥ .	70%	<	70%	≥ 70%		< 70%			
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No		
AA contains no or restricted outlet	🗌 1H	□.8H	□.7M	□ .5M	□.5M	□.4M	□.3L	□.2L		
AA contains unrestricted outlet	□.9H	□.7M	M6. 🛛	□.4M	□.4M	□.3L	.2L	.1L		

ii. Final Score and Rating: 0.6M Enter on the summary page on the Sediment/Nutrient/Toxicant Retention row.

Comments: AA likely receives sediments, nutrients, and/or toxicants from adjacent areas. ABR Baseline Report contains details on vegetation and adjacent estuary. Vegetation percentage includes bryophytes.

14F. Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14F does not apply, check NA here and proceed to 14G.)

For the <u>wetland</u> area subjected	Duration of surface water adjacent to rooted vegetation in the AA							
to erosive forces, % cover of species with deep, soil-binding root masses	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral					
≥65%	🗌 1H	□ .9H	7M					
35-64%	7M	.6M	□ .5M					
< 35%	🔀 .3L	□ .2L	□.1L					

ii. Final Score and Rating: 0.3L Enter on the summary page on the Sediment/Shoreline Stabilization row.

Comments: 14G. Production Export/Terrestrial and Aquatic Food Chain Support:

i. Level of Biological Activity(synthesis of wildlife and fish habitat ratings from 14B and 14C [check appropriate box in matrix])

General Fish Habitat	General Wildlife Habitat Rating (14B.iii.)						
Rating (14C.iii.)	E/H	М	L				
E/H	ΠH	ΠH	M				
М	Хн	🗆 M	M				
L	□ M	□ M					
NA	M	□ M					

ii. Rating Working from top to bottom, use the matrix below to arrive at the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14G.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as defined under #10 above, and A = "absent")

Α		Vegetated component >5 acres					Vegetated component 1-5 acres				Vegetated component <1 acre							
В	Hi	gh	Mod	erate	L	ow	Hi	gh	Mod	erate	Lo	w	Hi	gh	Mod	erate	Lo	ow 🛛
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	🛛 1H	□.7M	H8. 🗌	□ .5M	□ .6M	□.4M	□ .9H	□ .6M	□ .7M		□ .5M	□.3L	□ .8H	□ .6M	□ .6M	4M	□.3L	□.2L
S/I	□.9H	□.6M	□.7M	□ .4M	□ .5M	□.3L	□ .8H	□ .5M	□ .6M	□.3L	□ .4M	□.2L	□ .7M	□ .5M	□ .5M	□.3L	🗌 .3L	□.2L
T/E or A	□.8H	□.5M	.6M	□.3L	□ .4M	2L	□.7M	□ .4M	□ .5M	□.2L	□.3L	□.1L	□ .6M	□ .4M	□ .4M	□.2L	□.2L	□.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.)

A **Vegetated Upland Buffer** is an area with \geq 30% plant cover, \leq 2% noxious or invasive plant cover, and that is not subjected to periodic mowing or clearing (unless for weed control).

a) Is there an average ≥50-foot-wide vegetated upland buffer around ≥75% of the AA circumference?

 $\square Y \square N$ If yes, add 0.1 to the score in **14G.ii**. above and adjust the rating accordingly:

iv. Final Score and Rating: <u>1.0H</u> Enter on the summary page on the Production Export row.

Comments; There are no uplands present around the AA, so 14Giii was answered based on the vegetated wetland buffer of palustrine flat wetlands around the majority of the AA.

14H. Groundwater Discharge/Recharge: (Check the appropriate indicators in i. and ii. below.)

i. Disch	arge Ind	licators
----------	----------	----------

- The AA is a slope wetland (HGM type)
- □ Springs or seeps are known or observed
- □ Vegetation growing during dormant season
- □ Wetland occurs at the toe of a natural slope
- \Box AA permanently flooded during dry periods
- Wetland contains an outlet, but no inlet
- Other:

ii. Recharge Indicators (NA for fringe wetlands) Permeable substrate present without underlying impeding layer

- layer
 Wotland contains in
- Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge decreases
- downstream
- Other:

iii. Rating (use the information from i. and ii. above and the table below to arrive at [check] the functional points and rating)

Criteria		Duration of saturation at AA wetlands FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM							
	P/P	S/I	T/E	None					
Groundwater discharge or recharge indicators exist	🗌 1H	□ .7M	□.4M	□.1L					
Permafrost underlies the wetland or insufficient information exists	X NA								

iv. Final Score and Rating: <u>N/A</u> Enter on the summary page on the Groundwater Discharge/Recharge row. Comments: Not encursh information

Not enough information.

14I. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	wetla sprin forested associat	nd types [fe gs, seeps, c wetland typ tion listed as	ains irreplaceable types [fens, bogs, seeps, or mature tland type] OR a plant n listed as S1, S2, G1, a AKNHP (Appendix J)		does not co able wetland al diversity (tains plant a s S3, G3, S? KNHP (App	d types and #13) is high ssociation ?, or G? by	AA does not contain irreplaceable wetland types and structural diversity (#13) is low to moderate (Appendix J)		
Estimated relative abundance of wetland types (from 11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (from 12i and ii)	🗌 1H	6M. 🗌	□ .5M	□.8H	□.5M	□.4M	X.7M	□.4M	□.3L
Moderate disturbance at AA (from 12i and ii)	□.9H	□.5M	□.4M	□.7M	□.4M	□.3L	□.6M	□.3L	□.2L
<u>High</u> disturbance at AA (from12i and ii)	□.7M	□.3L	□.2L	□ .5M	□.2L	□.1L	□.4M	□.1L	□.1L

ii. Final Score and Rating: 0.7M Enter on the summary page on the Uniqueness row.

Comments:

14J. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity) **i. Is the AA a known or potential recreation or education site:** (check) $\square Y \square N$ (if 'Yes' continue with the evaluation; if 'No'

then check \square **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA:

 \square Educational/scientific study \square Consumptive recreation \square Non-consumptive recreation \square Other <u>Subsistence Use</u> **iii. Rating** (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	□.2H	🗌 .15H
Private ownership with general public access (no permission required)	🛛 .15H	□.1M
Private or public ownership without general public access, or requiring permission for public access	□ .1M	.05L

iv. Final Score and Rating: <u>0.15H</u> Enter on the summary page on the Recreation/Education Potential row. Comments:

Property is currently under private ownership but does not appear to prohibit subsistence use by the public. ATV trails occur occasionally near the AA. Scientific use requires a permit.

General Site Notes:

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with a check
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	Н	1.0	1.0		\boxtimes
B. General Wildlife Support	Н	1.0	1.0		\boxtimes
C. General Fish Support	М	0.6	1.0		
D. Water Storage	Н	0.8	1.0		X
E. Sediment/Nutrient/Toxicant Removal	М	0.6	1.0		
F. Sediment/Shoreline Stabilization	L	0.3	1.0		
G. Production Export/Food Chain Support	Н	1.0	1.0		X
H. Groundwater Discharge/Recharge	N/A	N/A	N/A		
I. Uniqueness	М	0.7	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15			
Totals:		6.15	8.0		
Percent of Possible Score (actual points divided by possible points)		69%			

AA1 - Estuarine Wetlands

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2

Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for Uniqueness; or

Score of 0.9 or 1 functional point for Water Storage and answer to Question 14Dii is "yes"; or

Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score \geq 70% (round to nearest whole number); or

Percent of possible score \geq 50% and 6th level hydrologic unit has already experienced \geq 15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4

Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for General Wildlife Support; or

□ Score of 0.6 to 0.8 functional point for General Fish Support; or

Score of 0.8 functional point for Uniqueness; or

Score 0.7 or 0.8 functional point for Water Storage and answer to Question 14Dii is "yes"; or

□ Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied

Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3

- □ Vegetated wetland component of AA < 1 acre (do not include upland vegetated buffer); and
- Score of 0.5 or lower for Uniqueness; and
- General Wildlife Support is 0.4 or lower; **and**
- General Fish Support score is 0.3 or lower; and

If answer to 14Dii is "no", score for Water Storage is 0.2, 0.1, or NA; and

□ Is not rated "High" for any function or service; **and**

X 1

Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (check appropriate category based on the criteria outlined above)

3

2

Category:

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4

Appendix B Waterbody Data and Categorization Form

Even if all or part of a waterbody is being rated as part of a wetland Assessment Area, it should also be rated separately on this form. Evaluate any waterbody that lies within your project's potential direct or indirect effect area, extending at least as far as the project's right-of-way limits.

The landward extent of the waterbody is the Ordinary High Water line for a non-tidal waterbody or the wetland boundary, whichever of those limits is located least landward.

1. Project name and ADOT&PF #:Charles Etok Edwardsen Mitigation Bank
2. Waterbody name (if applicable): Project-specific waterbody identifier (if applicable):AA4 - Palustrine Ponds
3. Evaluation date: Mo. 7 Day 28-31 Yr. 2015 4. Evaluator(s) and affiliation: <u>SLI, EKJ: ABR</u> 5. Purpose of evaluation:
Waterbody potentially affected by a proposed project Mitigation waterbody; pre-construction
Mitigation waterbody; post-construction X Other: _Mitigation waterbody, preservation, with project
6. Waterbody location(s):
Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; and T N or S; R E or W; S ; <u>Umiat</u> Meridian
Approx. stationing or mileposts or pertinent project component:
 Lat/long: <u>71.2823,-156.5088</u> Datum: _NAD 83 Neares<u>t community: Utgiaģvik, AK</u> Watershed: <u>Elson Lagoon - Frontal Beaufort Sea (12th level HUC 190602020105)</u> (smallest named stream), tributary of 7. Relationship to wetland AA: Is this waterbody also part of one or more wetland AAs? Y N (circle one) If yes, pertinent AA numbers: <u>West pond included in AA6 assessment</u> Identifying numbers of related data: photos GPS waypoint # <u>BEO-15</u> other: Map (#) showing waterbody: <u>Figure 6</u>
 8. Waterbody description: If a pond or lake, total area: <u>28.19</u> acres estimated or neasured? (circle one) If a stream: width in project area:feet (avg)feet (range) gradient (% slope):% Diameter and condition of any culverts in the project area on this waterbody: For any waterbody: avg. depth at low water_1 feet avg. depth at bankfull <u>2 (estimated)</u> feet description or average diameter of substrate, if observable (e.g., silt, sand, 2", 10") Sketch the typical cross-sectional bank shape(s) :

Describe the waterbody and surrounding land use and habitat types (water source, inlets, outlets, topography, adjacent land uses, relationship to other waterbodies and wetlands): <u>AA consists of four palustrine ponds of various sizes, surrounded by palustrine depressional</u> <u>sedge wetlands that are semipermanently flooded or palustrine flat seasonally flooded sedge wetlands. One pond on the west side of the project is surrounded by lacustrine fringe (AA6), and is included in that assessment as well.</u>

Briefly describe the condition of the 6th level hydrologic unit subregion with respect to human activities. Estimate the % that is modified, and list the predominant types of modification. <u>At the 6th level hydrologic unit subregion, very little is developed beyond Utgiaġvik, AK (<10%).</u>

9. Classification of Waterbody:

- Is the waterbody a
 - ____ Stream flowing water
 - ____ Lake larger than 20 acres in size when full of water
 - X Pond a still waterbody smaller than 20 acres in size when full, unvegetated or with floating or submerged vegetation

Class (Cowardin)	Water Regime	Modifier (if any)	% of the Waterbody
UN-PUB1H	P/P		100

Abbreviations:

Cowardin Classes (modified): Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes (see section 10 and Table 1 in the User's Manual): Permanent/Perennial I(P/P), Seasonal/Intermittent (S/I), Temporary/Ephemeral (T/E)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Artificial (**A**), Beaver-modified (**B**)

- 10. Disturbance of waterbody: Place check marks in the rows below that describe any past or present types of disturbance that may affect the waterbody within the project area. Describe any disturbance below.
 - _____ On the Category 5/Section 303(d) Impaired Waterbodies list (see Appendix I).
 - _____ Receives potentially low-quality runoff from development within the project area.
 - _____ Receives potentially low-quality runoff as non-point discharges from human activities upstream.
 - _____ Pipes discharge water from human developments upstream of, or within, the project area.
 - _____ Within the project area, the waterbody's banks or bed have been altered by grading, re-routing, placement of fill, excavation, or similar activities.
 - ____ The hydrologic regime has been altered by upstream developments (extensive storm drain systems, water withdrawals, a dam, etc.).
 - The banks or bed are mildly altered by human activities such as trampling, removal of some vegetation, building or clearing to the top of bank.
 - The waterbody has been affected by disturbance such as described above, but it has physically regained some features of natural banks or bed ("naturalized") such as development of pools and riffles, slight sinuosity, vertical or overhanging banks, overhanging vegetation.
 - ____ Known or suspected to contain invasive or exotic plants or animals anywhere in the waterbody. (See User's manual Appendix F for noxious and invasive plant information and Appendix G for a list of invasive animal species.) Write NA if not within your expertise.
 - ____ Disturbance other than described above.
 - X None of the above; waterbody is in essentially pristine condition.
 - Describe any disturbance (types, age, intensity, source, location):
 - None

List any noxious or invasive plant or animal species in the waterbody (Appendices F and G). If it is not within your expertise to accurately answer this question, or you were unable to investigate this, just cross out this question or record explanatory notes. None

11. Habitat for Federally Listed or Candidate Threatened or Endangered Animals or Other Species of Concern (see Appendix H):

Primary or critical habitat (list species)	O	s	Stellar's Eider	
Secondary habitat (list species)	D	<u> </u>	Spectacled Eider, Polar Bear	
Incidental habitat (list species)	D	s		
Sources for documented use (e.g., observ	ations,	records, etc):	ABR baseline Assessment, BEO Master Plan 2013, Ba	rrow
Comprehensive Plan 2014				

12. Wildlife Habitat:

Evidence of overall wildlife use in/on the waterbody (circle substantial, moderate, or low based on supporting evidence): Substantial (based on any of the following [check]): Minimal (based on any of the following [check]):

- ____ observations of abundant wildlife or high species diversity (during any period)
- X abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ____ presence of extremely limiting habitat features not available in the surrounding area
- X interviews with local biologists with knowledge of the AA

- ____ few or no wildlife observed during peak use periods
 - ___ little to no wildlife sign
 - ____ sparse adjacent upland food sources
 - ____ interviews with biologists with knowledge of the AA

(N)

Moderate (based on any of the following [check]):

- ____ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ____ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ____ adequate adjacent upland food sources
- ____ interviews with local biologists with knowledge of the AA

Other special wildlife features not addressed above:

13. I	Fish Habitat: (Answer this if the waterbody is used by fish or the existing situation is "correctable" such that the waterbody could be us	sed by fish.
	If the waterbody is not used by fish, fish use is not restorable, or is not desired from a management perspective, then circle NA.)	

Is the part of the waterbody within the project area shown in the ADF&G Anadromous Waters Catalog?	Y
Fish species or groups known or suspected to use the waterbody (any part of it):	

Optimal

Other resident species assumed. None observed in field visit.

Sources used for identifying fish species potentially found in the waterbody:

Aquatic cover cate	egory (see Table	3) (circle one):
--------------------	------------------	------------------------------------

(Adequate)

Poor

Waterbody Form Page 2 of 4

Does the waterbody contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for anadromous fish or sport fish? Y

Υ

N

Do noxious or invasive plant species (see **Appendix F**) or invasive fish species (see **Appendix G**) occur in the waterbody (anywhere)? Y(N)

Comments, or refer to section 10 above:

14. Recreation or Subsistence Potential:

Is the waterbody a known or potential recreation site? **() N** Used for subsistence activities? **() N** If 'Yes,' describe (travel, transport, boating, fishing, trail parallels or crosses it, next to a park or camping area, in proximity to where kids play, etc.).

Which best describes the current waterbody ownership in the project area?

____ Public ownership or public easement with general public access (no permission required)

X Private ownership with general public access (no permission required)

_____ Private or public ownership without general public access, or requiring permission for public access

Chart for Assignment of a Waterbody to a Management Category

Determine the appropriate category for the waterbody by working through the chart below. Look at the choices in the first column and choose the one that best describes the waterbody. Then, look at the choices in the second column to the right of the category you chose in column 1; choose the best type from column 2. To the right of that choice, select the best choice from column 3. Continue working to right through the chart until you reach the last column, where the Waterbody Category is assigned.

Waterbody Type		Category						
	Any flowing wa	1						
	Any flowing wa	2						
			natural (undisturbed)	supports salmon	1			
		open channel— perennial, seasonal,	or naturalized (recovered from disturbance, with	Supports resident and other non-salmon fish species	2			
	stream	intermittent, temporary, or ephemeral	natural-like banks, sinuosity, substrate)	Not known or thought to support fish	3			
			Channelized and not	supports salmon	1			
			naturalized	does not support salmon	3			
		Originally a stream, now in	a culvert		4			
Flowing	ditch (originally formed by	ор	2					
Waterbody	excavation; did not originally	Naturalized, does not support salmon			3			
	replace a stream)	Not naturalized, does not support salmon			4			
	Inactive (abandoned) channel	Seasonally or more often connected to active channel			same as active channel			
		(abandoned)		Cate	egory 1	2		
					irregularly (less than annually) connected to			3
			active channel that is	Cate	egory 3	3		
			Cate	egory 4	4			
		No existing connection to an active channel, even at high water			4			
	Any still water candidate thre	1						
	Any still waterbody that is secondary habitat for listed or candidate threatened or endangered species or primary habitat for other species of concern (see Appendix H)				2			
0	Other still	supports salmon	Spawning or rearing in	1				
Still Waterbody		supports saimon	Affected area is r	2				
(pond, lake)		Supports resident and other non-salmon fish species used for	Spawning or rearing ir	n potentially affected area	1			
	waterbodies	subsistence or recreation	Affected area is r	2				
		Supports fish not used by humans			3			
	Does not support fish			3				

Assigned Waterbody Category:

2 3

(1)

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4

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with an asterisk (*)
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	Н	1.0	1.0		
B. General Wildlife Support	н	0.9	1.0		
C. General Fish Support	М	0.6	1.0		
D. Water Storage	NA	NA	NA		
E. Sediment/Nutrient/Toxicant Removal	М	0.5	1.0		
F. Sediment/Shoreline Stabilization	NA	NA	NA		
G. Production Export/Food Chain Support	Н	0.9	1.0		
H. Groundwater Discharge/Recharge	NA	NA	NA		
I. Uniqueness	М	0.4	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15	NA		
Totals:		4.45	6.0		
Percentage of Possible Score (actual points divided by possible points)		74 %			

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):_AA4

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2.

____ Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

____ Score of 0.9 or 1 functional point for Uniqueness; or

____ Score of 0.9 or 1 functional point for Water Storage and answer to Question 14D.ii. is "yes"; or

____ Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score ≥ 70% (round to nearest whole number); or

Percent of possible score ≥ 50% and 6th level hydrologic unit subregion has already experienced ≥15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4. ______ Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

- ____ Score of 0.9 or 1 functional point for General Wildlife Support; or
- ____ Score of 0.6 to 0.8 functional point for General Fish Support; or
- ____ Score of 0.8 functional point for Uniqueness; or
- _____ Score 0.7 or 0.8 functional point for Water Storage and answer to Question 14D.ii. is "yes"; or
- Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied.

____ Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3. Vegetated wetland component of AA < 1 acre (do not include upland vegetated buffer); and

- Score of 0.5 or lower for Uniqueness; and
- ____ General Wildlife Support is 0.4 or lower; and
- ____ General Fish Support score is 0.3 or lower; and
- ____ If answer to 14D.ii. is "no", score for Water Storage is 0.2, 0.1, or NA; and
- ____ Is not rated "High" for any function or service; and
- ____ Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (circle appropriate category based on the criteria outlined above)

Category: 1 2 3 4

Appendix B Waterbody Data and Categorization Form

Even if all or part of a waterbody is being rated as part of a wetland Assessment Area, it should also be rated separately on this form. Evaluate any waterbody that lies within your project's potential direct or indirect effect area, extending at least as far as the project's right-of-way limits.

The landward extent of the waterbody is the Ordinary High Water line for a non-tidal waterbody or the wetland boundary, whichever of those limits is located least landward.

1. Project name and ADOT&PF #:
2. Waterbody name (if applicable): Project-specific waterbody identifier (if applicable):AA5 - Estuarine Waters
3. Evaluation date: Mo. 7 Day 28-31 Yr. 2015 4. Evaluator(s) and affiliation: <u>SLI, EKJ: ABR</u> 5. Purpose of evaluation:
Waterbody potentially affected by a proposed project Mitigation waterbody; pre-construction
Mitigation waterbody; post-construction $X_{}$ Other: _Mitigation waterbody, preservation, with project
6. Waterbody location(s):
Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; S. 1; Umiat Meridian
Approx. stationing or mileposts or pertinent project component:
Lat/long: _71.2823, -156.5088 Datum: _NAD 83 Nearest community: _Utqiaģvik, AK Watershed: Elson Lagoon - Frontal Beaufort Sea (12th level HUC 190602020105) (smallest named stream), tributary of (smallest named stream), tributary of 7. Relationship to wetland AA: Is this waterbody also part of one or more wetland AAs? Y N (circle one)If yes, pertinent AA numbers: _AA3- Riverine_ Identifying numbers of related data: photos GPS waypoint # <u>BEO-30,BEO-31</u> (outside project boundary, but similar) other: Map (#) showing waterbody: Figure 6
 8. Waterbody description: If a pond or lake, total area: <u>3.37</u> acres estimated or measured (circle one) If a stream: width in project area:feet (avg) feet (range) gradient (% slope):% Diameter and condition of any culverts in the project area on this waterbody:%
For any waterbody: avg. depth at low water 3 feet avg. depth at bankfull 4 (estimated) feet description or average diameter of substrate , if observable (e.g., silt, sand, 2", 10")

Describe the waterbody and surrounding land use and habitat types (water source, inlets, outlets, topography, adjacent land uses, relationship to other waterbodies and wetlands): <u>AA consists of two small estuaryies; one bounded by Ikpik Slough to the north and adjecent to a</u> riverine section (AA3), and the second bounded by the Beaufort Sea to the east. Both are surrounded by palustrine flats (AA1).

Briefly describe the condition of the 6th level hydrologic unit subregion with respect to human activities. Estimate the % that is modified, and list the predominant types of modification. <u>At the 6th level hydrologic unit subregion, very little is developed beyond Utgiaģvik, AK (<10%).</u>

9. Classification of Waterbody:

Is the waterbody a

X_ Stream - flowing water

____ Lake - larger than 20 acres in size when full of water

____ Pond – a still waterbody smaller than 20 acres in size when full, unvegetated or with floating or submerged vegetation

Class (Cowardin)	Water Regime	Modifier (if any)	% of the Waterbody
UN-E2USP	P/P		100

Abbreviations:

Cowardin Classes (modified): Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes (see section 10 and Table 1 in the User's Manual): Permanent/Perennial I(P/P), Seasonal/Intermittent (S/I), Temporary/Ephemeral (T/E)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Artificial (**A**), Beaver-modified (**B**)

- 10. Disturbance of waterbody: Place check marks in the rows below that describe any past or present types of disturbance that may affect the waterbody within the project area. Describe any disturbance below.
 - On the Category 5/Section 303(d) Impaired Waterbodies list (see Appendix I).
 - Receives potentially low-quality runoff from development within the project area.
 - Receives potentially low-quality runoff as non-point discharges from human activities upstream.
 - Pipes discharge water from human developments upstream of, or within, the project area.
 - Within the project area, the waterbody's banks or bed have been altered by grading, re-routing, placement of fill, excavation, or similar activities.
 - The hydrologic regime has been altered by upstream developments (extensive storm drain systems, water withdrawals, a dam, etc.).
 - The banks or bed are mildly altered by human activities such as trampling, removal of some vegetation, building or clearing to the top of bank.
 - The waterbody has been affected by disturbance such as described above, but it has physically regained some features of natural banks or bed ("naturalized") such as development of pools and riffles, slight sinuosity, vertical or overhanging banks, overhanging vegetation.
 - Known or suspected to contain invasive or exotic plants or animals anywhere in the waterbody. (See User's manual Appendix F for noxious and invasive plant information and Appendix G for a list of invasive animal species.) Write NA if not within your expertise.
 - Disturbance other than described above.
 - X None of the above; waterbody is in essentially pristine condition.
 - Describe any disturbance (types, age, intensity, source, location):

None

List any noxious or invasive plant or animal species in the waterbody (Appendices F and G). If it is not within your expertise to accurately answer this question, or you were unable to investigate this, just cross out this question or record explanatory notes. None

11. Habitat for Federally Listed or Candidate Threatened or Endangered Animals or Other Species of Concern (see Appendix H):

Waterbody is Documented (D) or Suspected (S) to support (circle one based on definitions contained in instructions):

Primary or critical habitat (list species)	DS	
Secondary habitat (ist species)	D S	Spectacled Eider, Stellar's Eider,Polar Bear
Incidental habitat (list species)	DS	

Sources for documented use (e.g., observations, records, etc): ABR baseline Assessment, BEO Master Plan 2013, Barrow

Comprehensive Plan 2014

12. Wildlife Habitat:

Evidence of overall wildlife use in/on the waterbody (circle substantial, moderate, or low based on supporting evidence): Substantial (based on any of the following [check]): Minimal (based on any of the following [check]):

- Substantial (based on any of the following [check]):
- observations of abundant wildlife or high species diversity (during any period)
- abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- presence of extremely limiting habitat features not available in the surrounding area
- interviews with local biologists with knowledge of the AA

- ___ little to no wildlife sign
 - ____ sparse adjacent upland food sources
 - ____ interviews with biologists with knowledge of the AA

(N)

____ few or no wildlife observed during peak use periods

Moderate (based on any of the following [check]):

- observations of scattered wildlife groups or individuals or relatively few species during peak periods
- common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- adequate adjacent upland food sources

interviews with local biologists with knowledge of the AA х

Other special wildlife features not addressed above:

13.	Fish Habitat: (Answer this if the waterbody is used by fish or the existing situation is "correctable" such that the waterbody could be used by	y fish.
	If the waterbody is not used by fish, fish use is not restorable, or is not desired from a management perspective, then circle NA.)	

Is the part of the waterbody within the project area shown in the ADF&G Anadromous Waters Catalog?	Y
Fish species or groups known or suspected to use the waterbody (any part of it):	

Optimal

Other resident species assumed. None observed in field visit.

Sources used for identifying fish species potentially found in the waterbody:

Aquatic	cover	category	(see	Table 3)) (circle	one):	
---------	-------	----------	------	----------	-----------	-------	--

Adequate

Poor

Waterbody Form Page 2 of 4

Does the waterbody contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for anadromous fish or sport fish? Y

Υ

N

Do noxious or invasive plant species (see **Appendix F**) or invasive fish species (see **Appendix G**) occur in the waterbody (anywhere)? Y(N)

Comments, or refer to section 10 above:

14. Recreation or Subsistence Potential:

Is the waterbody a known or potential recreation site? **() N** Used for subsistence activities? **() N** If 'Yes,' describe (travel, transport, boating, fishing, trail parallels or crosses it, next to a park or camping area, in proximity to where kids play, etc.).

Which best describes the current waterbody ownership in the project area?

____ Public ownership or public easement with general public access (no permission required)

X Private ownership with general public access (no permission required)

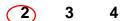
_____ Private or public ownership without general public access, or requiring permission for public access

Chart for Assignment of a Waterbody to a Management Category

Determine the appropriate category for the waterbody by working through the chart below. Look at the choices in the first column and choose the one that best describes the waterbody. Then, look at the choices in the second column to the right of the category you chose in column 1; choose the best type from column 2. To the right of that choice, select the best choice from column 3. Continue working to right through the chart until you reach the last column, where the Waterbody Category is assigned.

Waterbody Type		Waterbody Characteristics									
		Any flowing waterbody that is documented or suspected critical or primary habitat for listed or candidate threatened or endangered species (see Appendix H)									
-	Any flowing wa endangered s	2									
			natural (undisturbed)	supports salmon	1						
		open channel— perennial, seasonal,	or naturalized (recovered from disturbance, with	Supports resident and other non-salmon fish species	2						
	stream	intermittent, temporary, or ephemeral	natural-like banks, sinuosity, substrate)	Not known or thought to support fish	3						
			Channelized and not	supports salmon	1						
			naturalized	does not support salmon	3						
		Originally a stream, now in	Originally a stream, now in a culvert								
Flowing	ditch (originally formed by	2									
Waterbody	excavation; did not originally	Natur	3								
	replace a stream)	Not nat	4								
	Inactive (abandoned)	Seasonally or	same as active channel								
			Cate	2							
		irregularly (less than annually) connected to	Cate	egory 2	3						
	channel	active channel that is	Cate	5							
			Cate	4							
		No existing connect	4								
		body that is documented or a eatened or endangered spec		ry habitat for listed or	1						
		body that is secondary habit mary habitat for other specie			2						
0.111		supports salmon	Spawning or rearing ir	n potentially affected area	1						
Still Waterbody			Affected area is	2							
(pond, lake)	Other still waterbodies	Supports resident and other non-salmon fish species used for	Spawning or rearing ir	n potentially affected area	1						
	waterboures	subsistence or recreation	Affected area is	migratory route only	2						
		Supports fish not used by humans			3						
		Does not support fish			3						

Assigned Waterbody Category:



1

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Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with an asterisk (*)
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	М	0.7	1.0		
B. General Wildlife Support	н	0.9	1.0		
C. General Fish Support	М	0.6	1.0		
D. Water Storage	NA	NA	NA		
E. Sediment/Nutrient/Toxicant Removal	М	0.5	1.0		
F. Sediment/Shoreline Stabilization	NA	NA	NA		
G. Production Export/Food Chain Support	М	0.6	1.0		
H. Groundwater Discharge/Recharge	NA	NA	NA		
I. Uniqueness	М	0.7	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15	NA		
Totals:		4.15	6.0		
Percentage of Possible Score (actual points divided by possible points)		69 %			

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2.

____ Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

____ Score of 0.9 or 1 functional point for Uniqueness; or

____ Score of 0.9 or 1 functional point for Water Storage and answer to Question 14D.ii. is "yes"; or

____ Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score ≥ 70% (round to nearest whole number); or

Percent of possible score ≥ 50% and 6th level hydrologic unit subregion has already experienced ≥15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4. ______ Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

- ____ Score of 0.9 or 1 functional point for General Wildlife Support; or
- ____ Score of 0.6 to 0.8 functional point for General Fish Support; or
- ____ Score of 0.8 functional point for Uniqueness; or

_____ Score 0.7 or 0.8 functional point for Water Storage and answer to Question 14D.ii. is "yes"; or

Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied.

____ Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3. Vegetated wetland component of AA < 1 acre (do not include upland vegetated buffer); and

- Score of 0.5 or lower for Uniqueness; and
- ____ General Wildlife Support is 0.4 or lower; and
- ____ General Fish Support score is 0.3 or lower; and
- If answer to 14D.ii. is "no", score for Water Storage is 0.2, 0.1, or NA; and
- ____ Is not rated "High" for any function or service; and
- ____ Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (circle appropriate category based on the criteria outlined above)

Category: 1 2 3 4

Appendix A Wetland Assessment Data Form

<u>Digital Form</u> – Use only if completing on a computer. Otherwise, use form in AKWAM manual.

Use this form to assess areas that are primarily wetlands (versus waterbodies). For waterbodies, use the Waterbody Categorization Form.

1. Project name: Charles Etok Edwardsen Mitigation Bank 2. Assessment Area #(s): AA6 - Lacustrine Fringe
3. Evaluation date: Mo. <u>07</u> Day <u>30</u> Yr. <u>2015</u> 4. Evaluator(s) and affiliation: <u>SLI, EKJ,ABR</u> 5. Purpose of evaluation:
Wetland/waterbody potentially affected by a proposed project Mitigation wetlands; pre-construction Mitigation wetlands; post-construction Other Mitigation wetlands; preservation; Current/ Wetland location(s): with project condition Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; S. 1; Umiat Meridian Nearest community: Utqiaġvik, AK Watershed: Elson Lagoon - Frontal Beaufort Sea (12 th level HUC) 190602020105) Ecoregion (from USCOE 2007):
 7. Identifying numbers of related data: wetland determination forms <u>BEO-15, BEO-01</u> photos <u>see ABR Report</u> <u>Appendices A and C</u> GPS waypoint #other Map (#) showing AA: <u>Figure 6</u> (closely follow the User's Manual instructions for identifying the AA) <u>Briefly describe the features that define the limits of the AA (e.g., tributary, wetland/upland boundary, extreme low tide elevation):</u> AA1 consists of NWI class palustrine (PEM1H, PEM1F), lacustrine fringe (HGM) graminoid (sedge) marsh surrounding 10 - 25 acre ponds (PUBH Shallow Open Water without Islands/L1UBH Deep Open Water without Islands, HGM: Depressional). Occurs along the fringes of 2 small ponds. Vegetation types are aquatic sedge marsh or floating mats with significant moss cover. Typical graminoid species include Arctophila fulva, Carex aquatilis and Eriophorum angustifolium.
 8. Wetland size (total acres, not just AA): acres (visually estimated) or <u>37.35</u> acres (measured, e.g., in GIS) 9. Assessment area (AA) size: carea (visually estimated) or 27.35 carea (measured)

9. Assessment area (AA) size: _____ acres (visually estimated) or <u>37.35</u> acres (measured) *Note:* _____

Acreage of the AA MINUS the part that is waterbody that will be separately assessed using the waterbody form: 3.37 acres of wetland in AA

10. Classification of Wetland and Waterbody in the Wetland AA:

Class (Cowardin)	Water Regime (Cowardin)	Modifier (if any; Cowardin)	% of AA
EM - PEM1H	P/P		7%
EM - PEM1F	S/I		2%
UN - PUBH/L1UBH	P/P		91%

HGM Class (Brinson)	% of AA						
LF	9%						
	%						
	%						
	%						

HGM Classes: Riverine (R),

Lacustrine Fringe (LF)

Depressional (D), Slope (S), Flat (F),

Abbreviations:

Cowardin Classes: Forested Wetland (**FO**), Scrub-Shrub Wetland (**SS**), Emergent Wetland (**EM**), Moss-lichen Wetland (**ML**), Aquatic Bed (**AB**), Unvegetated (**UN**)

Water (Inundation) Regimes: Permanent/Perennial (P/P),

Seasonal/Intermittent (S/I), Temporary/Ephemeral/Saturated (T/E)

 $\begin{array}{l} \textbf{Modifiers:} \ \text{Excavated (X), Impounded (I), Diked (D), Partly Drained (PD), } \\ \text{Farmed (F), Artificial (A), Beaver-modified (B)} \end{array}$

11. Estimated relative abundance of similar wetlands within the same 6th level hydrologic unit subregion (see definitions in user's manual):

(check one)

Unknown

⊠Rare Common Abundant

What information sources did you use for this estimate? Estimate based on visual observation of lacustrine fringe wetlands within HUC.

12. General condition of AA:

i. Disturbance (see user's manual for descriptions of disturbance levels; check appropriate box):

Conditions adjacent to AA	Predominant conditions adjacent to (within 500 feet of) the AA, <u>plus</u> any area that drains into the AA								
Conditions within AA	Adjacent land is in a natural state	Adjacent land has experienced minimal or minor disturbance	Adjacent land is substantially disturbed						
AA is in a natural state	Iow disturbance	low disturbance	moderate disturbance						
AA has experienced minimal or minor disturbance	moderate disturbance	moderate disturbance	high disturbance						
AA is substantially disturbed	high disturbance	high disturbance	high disturbance						

Describe the disturbance within the AA (type, age, intensity, source of disturbance, location): AA is adjacent to PEM1F, Depressional wet sedge meadow tundra with a few ATV trails adjacent to the AA.

ii. Consider the 6th level HU containing the AA again. If you estimate that more than 10% of the land in the 6th level HU is disturbed, check

here , and choose (below) the disturbance level that is one level higher:

□ low disturbance

moderate disturbance

high disturbance

iii. List any noxious or invasive plant or animal species in the AA or surrounding lands (specify which are in the AA): None.

iv. Briefly describe the AA and surrounding land use and habitat types (dominant species, water source, topography, approximate slope, inlets and outlets, land use, relationship to other AAs, adjacent vegetation types and land uses): AA1 consists of NWI class palustrine (PEM1H, PEM1F), lacustrine fringé (HGM) graminoid (sedge) marsh surrounding two small (10 - 25 acre) ponds (PUBH Shallow Open Water without Islands/L1UBH Deep Open Water without Islands, HGM: Depressional). Occurs along the fringes of 2 small ponds. Vegetation types are aquatic sedge marsh or floating mats with significant moss cover. Typical graminoid species include Arctophila fulva, Carex aquatilis and Eriophorum angustifolium. The AA is surrounded by a wetland complex that includes Saturated Graminoid Meadow and Semipermanently Flooded Wet Graminoid Meadow, with virtually no disturbance.

13. Structural Diversity of AA (based on number of simplified Cowardin vegetated classes present, listed in #10 above):

Existing # of Cowardin vegetated classes in AA	Rating
≥3 classes; or 2 classes if 1 is forested	ΠH
2 classes; or 1 class if forested	ХM
1 class, and humans do not prevent establishment of additional classes	□ M
1 class, and humans limit establishment of additional classes	

14A. Habitat for Federally Listed or Candidate Threatened or Endangered Plants or Animals or Other Species of Concern: i., AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species) D D S species: <u>Steller's eider (T)</u>

Secondary habitat (list species)

D S species: Polar bear (T), Spectacled Eider

Incidental habitat (list species)

None or unknown

D S species:

ii. Rating (use the conclusions from 14A.i. above and the matrix below to arrive at [check] the functional points and rating):

Highest Habitat Level	doc/ primary	sus/ primary	doc/ secondary	sus/ secondary	doc/ incidental	sus/ incidental	None
One or more of the species listed in 14A.i. is a federally Listed or Candidate Threatened or Endangered Speceis	🗌 1H	<u>⊠</u> .9H	□.8M	□ .7M	□.3L	□.1L	🗌 OL
Species listed 14A.i. are all "Other Species of Concern" (i.e., not listed under the Endangered Species Act)	□.8M	□.7M	□.6M	□ .5M	□.2L	🗌 .1L	🗆 OL

Sources for documented or suspected use (e.g., observations, records, etc): Two threatened sea duck species, Steller's Eider (Polysticta stelleri) and Spectacled Eider (Somateria fischeri), are present in the area during the breeding season (ABR Report, BEO Master Plan 2013, Barrow Comprehensive Plan 2014). Stellar's Eider were documented in surrounding palustrine wetlands and deep open water adjacent to the AA (ALCC 2012 from ABR Baseline Assessment, Appendix C). Based on expected habitat use (see ABR report), both eider species are expected to use AA habitat at some point in their life cycle. The AA is within the 2010 Polar Bear critical habitat zone (although it is under review).

iii. Final Score and Rating: 0.9H Enter on the summary page on the Habitat for Federally Listed Species row.

14B. General Wildlife Support Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

[abaak]	1.
[check]).

Minimal (based on any of the following

interviews with local biologists with

few or no wildlife observations

□ sparse adjacent upland food

☐ little to no wildlife sign

- Observations of abundant wildlife #s or high species diversity (during any period) during peak use periods
- abundant wildlife sign such as scat, tracks, nest structures, game trails, etc. presence of extremely limiting habitat features not available in the surrounding area

sources

interviews with local biologists with knowledge of the AA or its habitat type knowledge of the AA

Moderate (based on any of the following [check]):

observations of scattered wildlife groups or individuals or relatively few species during peak periods

common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.

- upland food sources exist in moderate quantity
- interviews with local biologists with knowledge of the AA or its habitat type
- ii. Wildlife habitat features Working from top to bottom, check appropriate AA attributes in the matrix to arrive at the rating. Structural diversity is from question #13.

For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent age of the AA (see #10).

Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent. See instructions for further definitions of these terms.

Structural diversity (from #13)	High							Moderate							Low					
Class cover distribution (all vegetated classes)	Even			Uneven			Even			Uneven				Even						
Longest duration of surface water in ≥ 10% of AA, or immediately abutting the AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i & 12ii)	ΠE	E	ΠE	□н	ΠE	ΠE	ПΗ	□н	ΣE	Пн	ПН	□м	E	□н	□м	□м	ΠE	Πн	□М	□м
<i>Moderate</i> disturbance at AA (see #12i & 12ii)	□н	ПН	Πн	ПН	ПН	□н	ПΗ	□м	ПН	ПН	Μ	□м	ПН	ПМ	□м	ΠL	□н	□м	ΠL	ΠL
<i>High</i> disturbance at AA (see #12i & 12ii)	□м	□м	M	L	M	□м	ΠL	L	M	□М	ΠL	L	□М	ΠL	L	L	٦L	L	L	ΠL

iii. Rating (use the conclusions from i. and ii. above and the matrix below to arrive at [check] the functional points and rating)

		Wildlife habitat feat	tures rating (ii)	
Evidence of wildlife use (i)	Exceptional	High	Moderate	Low
Substantial	🛛 1E	□.9H	□ .8H	□.7M
Moderate	□ .9H	□.7M	□ .5M	.3L
Minimal	.6M	.4M	🗌 .2L	.1L

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iv. Final Score and Rating: <u>1.0E</u> Enter on the summary page on the General Wildlife Support row. **Comments:**

The AA evaluation included evidence of use by dunlin, goose, swan, grazers, fox, and other species. In addition, the ABR Baseline Assessment included a review of wildlife use by wetland functional class for the region including the AA.

14C. General Fish Support Rating: (Assess this function if any part of the AA (including the waterbody part of a wetland AA) is used by fish or the existing situation is "correctable" such that the AA could be used by fish. If the AA is not used by fish, fish use is not restorable, or is not desired from a management perspective, then check \square **NA** here and proceed to 14D.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check] the functional points and rating)

Duration of surface water in AA	Perma	nent / Pereni	nial	Seas	onal / Intermi	ttent	Tempo	orary / Ephem	neral
Aquatic hiding / resting / escape cover in waterbody (Table 3 in manual)	Optimal	Adequate	Poor	Optimal	Adequate	Poor	Optimal	Adequate	Poor
Anadromous salmon species	🗌 1E	□.8H	□.6M	□.9H	□.7M	□.5M	□.7M	□.5M	□.3L
Resident and non- salmon sport and subsistence species	□.9H	□.7M	□.5M	□ .8H	□.6M	□.4M	□.6M	□.4M	□.2L
Other resident species	□.8H	⊠.6M	□.4M	□.7M	□.5M	□.3L	□.5M	□.3L	□.1L

Sources used to identify fish species potentially found in AA: ADF&G Anadromous Waters Catalog (ADF&G 2015a); ADF&G Freshwater Fish Inventory (ADF&G 2015b).

ii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA precluded or substantially reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the current Alaska Department of Environmental Conservation list of Category 5 / Section 303(d) Impaired Waterbodies (unless its impaired uses are named and aquatic life is not listed as impaired)?

 $\square Y \square N$ If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

b) Do noxious or invasive plant species or invasive fish species (see Appendices F and G) occur in the AA?

Y N If yes, reduce the score in 14C.i. by 0.1: _____ (If no, do not change the score.)

iii. Final Score and Rating: 0.6M Enter on the summary page on the General Fish Support row. Comments:

14D. Water Storage: (Applies to wetlands that flood or pond from overbank flooding, precipitation, or overland flow from uplands. If no wetlands in the AA are subject to inundation or ponding, check \Box **NA** here and proceed to 14E.)

i. Rating

Estimate the variation in the water volume stored in the **wetland** portion of the AA **that experiences surface ponding or flooding** during the typical year, between break-up and freeze-up. First, identify the part of the AA that is both wetland and has surface water sometime between breakup and freezeup (the "flooded wetland"). Estimate its area in acres: **3.37** acres = A.

Second, estimate the range in that flooded wetland's water surface elevation between its lowest and highest elevation during the unfrozen period, in feet. Call this D for depth: <u>1.25 feet</u> = D. For example, if the water table is typically one foot below the ground surface during the driest part of summer, and is typically 6 inches above the surface following breakup, the range is 18 inches, or 1.5 feet. Consider evidence such as water marks, staining on vegetation or rocks, drift lines, and the depth to the water table in your soil pit. Consider also the elevation of the wetland surface relative to the elevation of the water surface in an adjacent stream (i.e., does the channel overflow its banks into the wetland?). During a flood, the depth of water over a stream channel is likely to be double its depth when the stream is full to its banks. Consider the area the stream would flood when the water is that deep.

Multiply the range in the flooded wetland's water surface elevation (D) times the area (A) to estimate the maximum storage volume in acre-feet. D **1.25** feet X A **3.37** acres = **4.21** acre-feet. Use this storage volume estimate in the matrix below.

Next, determine the portion of the flooded wetland that is forested, shrub-dominated, or is neither of those but is dominated by hummocks or tussocks at least one foot in height:

% of AA that experiences water surface fluctuation that is forested or scrub/shrub $\underline{\ 0}\%$

plus the additional % of the flooded wetland that is hummocky ~~30~%

= 30 % of flooded wetland with water-slowing roughness. Use this percentage in the second row of the matrix below.

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Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating.

Estimated maximum acre-feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding		>5 acre-fe	et	1	to 5 acre-f	eet	<1	l acre-foot	
% of flooded wetland classified as forested or scrub/shrub or dominated by hummocks > 1 foot tall	>75%	25-75%	<25%	>75%	25-75%	<25%	>75%	25-75%	<25%
AA contains no outlet or restricted outlet	□ 1H	□.9H	□.6M	□ .8H	X .7M	□.5M	□.4M	□.3L	□.2L
AA contains unrestricted outlet	.9H	□.8H	□.5M	.7M	□.6M	□.4M	□.3L	□.2L	□.1L

ii. Final Score and Rating: $\underline{0.7M}$ Enter on the summary page on the Water Storage row.

Comments:

Wetlands within AA are subject to seasonal or irregular inundation and likely store water during those periods. There were no channelized outlets observed, but sheet flow to and from surrounding wetlands is likely.

iii. Potential Property Protection

Are ≥10 acres of wetland in the AA subject to flooding AND are ma	an-ma	de features which may be significantly damaged by floods
located within 0.5 mile downstream of the AA (check)?	Ν	(This information will be used later.)
Comments:		

14E. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are, or with the planned project will be, subject to such input, check \Box **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	proposed levels of levels substan sources	future land us f sediments, i s such that ot tially impaired s of nutrients hication are p	se) has pote nutrients, or her function d. Minor sec or toxicants,	s are not limentation, or signs of	toxicants su substantially in sources of nut	aterbodies or ad use has pot of sediments, ch that other f apaired. Major	AA receives iential to deli nutrients, or unctions are sedimentati ants, unnatu	or iver on, ral
% cover of vegetation in AA	≥ 70% < 70%			≥ 70% < 70%				
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	🗌 1H	□.8H	.7M	□ .5M	□.5M	□.4M	□.3L	□.2L
AA contains unrestricted outlet	□.9H	□.7M	□.6M	.4M	□ .4M	.3L	.2L	.1L

ii. Final Score and Rating: 0.7M Enter on the summary page on the Sediment/Nutrient/Toxicant Retention row.

Comments:

AA likely receives sediments, nutrients, and/or toxicants from adjacent areas. ABR Baseline Report contains details on vegetation and ponding observed. Lacustrine Fringe portion of AA is well-vegetated compared to open water portion of AA.

14F. Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14F does not apply, check **NA** here and proceed to 14G.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

For the <u>wetland</u> area subjected	Duration of sur	face water adjacent to rooted vege	tation in the AA
to erosive forces, % cover of species with deep, soil-binding root masses	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥65%	🗌 1H	□ .9H	7M
35-64%	⊠ .7M	.6M	□ .5M
< 35%	□ .3L	□ .2L	.1L

ii. Final Score and Rating: **0.7M** Enter on the summary page on the Sediment/Shoreline Stabilization row.

Comments:

14G. Production Export/Terrestrial and Aquatic Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings from 14B and 14C [check appropriate box in matrix])

General Fish Habitat	General	l Wildlife Habitat Rating (14B.iii.)						
Rating (14C.iii.)	E/H	М	L					
E/H	ΠH	ΠH	□ M					
М	ХH	M	M					
L	M	□ M						
NA	M	□ M						

ii. Rating Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14G.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as defined under #10 above, and A = "absent")

Α	<i> </i>	/egetate	d comp	onent >	5 acres	;	V	egetate	ed com	ponent	1-5 acre	es		Vegetat	ed con	ponent	<1 acr	e
В	Hi	gh	Mod	erate	L	ow	Hi	gh	Mod	erate	Lo	w	Hi	gh	Mod	erate	Lo	ow
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	🗌 1H	□.7M	□.8H	□ .5M	□ .6M	□.4M	□ .9H	区 .6M	7M	4M	□ .5M	□.3L	□ .8H	□ .6M	□ .6M	.4M	□.3L	□.2L
S/I	□.9H	□.6M	□.7M	□ .4M	□ .5M	□.3L	□ .8H	□ .5M	□ .6M	🗌 .3L	□ .4M	□.2L	□ .7M	□ .5M	□ .5M	🗌 .3L	□.3L	□.2L
T/E or A	□.8H	□.5M	□.6M	□.3L	□ .4M	□.2L	□.7M	□ .4M	□ .5M	□.2L	□.3L	□.1L	□ .6M	□ .4M	4M	□.2L	□.2L	□.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.)

A **Vegetated Upland Buffer** is an area with \ge 30% plant cover, \le 2% noxious or invasive plant cover, and that is not subjected to periodic mowing or clearing (unless for weed control).

a) Is there an average ≥50-foot-wide vegetated upland buffer around ≥75% of the AA circumference?

Y N If yes, add 0.1 to the score in **14G.ii.** above and adjust the rating accordingly:

iv. Final Score and Rating: 0.7M Enter on the summary page on the Production Export row.

Comments: There are no uplands present around the AA, so 14Giii was answered based on the vegetated wetland buffer around the the AA.

14H. Groundwater Discharge/Recharge: (Check the appropriate indicators in i. and ii. below.)

i. Discharge Indicators

- The AA is a slope wetland (HGM type)
- $\hfill\square$ Springs or seeps are known or observed
- Vegetation growing during dormant season
- □ Wetland occurs at the toe of a natural slope
- □ AA permanently flooded during dry periods
- Wetland contains an outlet, but no inlet
- Other:

ii. Recharge Indicators 🛛 (NA for fringe wetlands) Permeable substrate present without underlying impeding laver

- U Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge decreases
- downstream

Other: _____

iii. Rating (use the information from i. and ii. above and the table below to arrive at [check] the functional points and rating)

Criteria			lands FROM GROU THAT IS RECHAR(ER SYSTEM			
	P/P	S/I	T/E	None		
Groundwater discharge or recharge indicators exist	□ 1H □ .7M □ .4M □ .1					
Permafrost underlies the wetland or insufficient information exists	NA					

iv. Final Score and Rating: <u>N/A</u> Enter on the summary page on the Groundwater Discharge/Recharge row. Comments:

N/A for fringe wetlands.

14I. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	wetla sprin forested associat	tion listed as	ns, bogs,	irreplace structura OR con listed a	does not co able wetland al diversity (tains plant a s S3, G3, S? KNHP (App	d types and #13) is high ssociation ?, or G? by	irreplace structu		d types and (#13) is low
Estimated relative abundance of wetland types (from 11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (from 12i and ii)	🗌 1H	6M. 🗌	□ .5M	□.8H	□.5M	□.4M	.7M	□.4M	□.3L
Moderate disturbance at AA (from 12i and ii)	□.9H	□.5M	□.4M	□.7M	□.4M	□.3L	□.6M	□.3L	□.2L
<u>High</u> disturbance at AA (from12i and ii)	□.7M	□.3L	□.2L	□.5M	□.2L	□.1L	□.4M	□.1L	□.1L

ii. Final Score and Rating: 0.7M Enter on the summary page on the Uniqueness row.

Comments:

14J. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity) **i. Is the AA a known or potential recreation or education site:** (check) $\boxtimes Y \square N$ (if 'Yes' continue with the evaluation; if 'No'

then check \Box **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA:

 \square Educational/scientific study \square Consumptive recreation \square Non-consumptive recreation \square Other Subsistence Use iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	🗌 .2H	🗌 .15H
Private ownership with general public access (no permission required)	🛛 .15H	□.1M
Private or public ownership without general public access, or requiring permission for public access	□ .1M	🗌 .05L

iv. Final Score and Rating: 0.1M Enter on the summary page on the Recreation/Education Potential row. Comments:

Property is currently under private ownership but does not appear to prohibit subsistence use by the public. ATV trails occur occasionally near the AA. Scientific use requires a permit.

General Site Notes:

FUNCTION AND SERVICE SUMMARY AND OVERALL RATING FOR WETLAND AA #(s):

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with a check
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	Н	0.9	1.0		
B. General Wildlife Support	Н	1.0	1.0		\boxtimes
C. General Fish Support	М	0.6	1.0		
D. Water Storage	М	0.7	1.0		
E. Sediment/Nutrient/Toxicant Removal	М	0.7	1.0		\boxtimes
F. Sediment/Shoreline Stabilization	М	0.7	1.0		
G. Production Export/Food Chain Support	М	0.7	1.0		\boxtimes
H. Groundwater Discharge/Recharge	N/A	N/A	N/A		
I. Uniqueness	М	0.7	1.0		
J. Recreation/Education Potential (bonus points)	Н	0.15			
Totals:		6.15	8.0		
Percent of Possible Score (actual points divided by possible points)		77%			

AA1 - Estuarine Wetlands

Category 1 Wetland: Must satisfy one of the following criteria; otherwise go to Category 2

Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; or

Score of 0.9 or 1 functional point for Uniqueness; or

Score of 0.9 or 1 functional point for Water Storage and answer to Question 14Dii is "yes"; or

Score of 0.9 or 1 functional point for General Fish Support; or

Percent of possible score \geq 70% (round to nearest whole number); or

Percent of possible score \geq 50% and 6th level hydrologic unit has already experienced \geq 15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied and meets any one of the following criteria; otherwise go to Category 4

Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; or

- Score of 0.9 or 1 functional point for General Wildlife Support; or
- Score of 0.6 to 0.8 functional point for General Fish Support; or
- Score of 0.8 functional point for Uniqueness; or

Score 0.7 or 0.8 functional point for Water Storage **and** answer to Question 14Dii is "yes"; **or**

□ Percent of possible score \geq 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied

Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied and all of the following criteria are met; if not, go to Category 3

- Vegetated <u>wetland</u> component of AA < 1 acre (do <u>not</u> include upland vegetated buffer); and
- Score of 0.5 or lower for Uniqueness; and
- General Wildlife Support is 0.4 or lower; **and**
- General Fish Support score is 0.3 or lower; and

If answer to 14Dii is "no", score for Water Storage is 0.2, 0.1, or NA; and

- □ Is not rated "High" for any function or service; **and**
- Percent of possible score < 35% (round to nearest whole number).

OVERALL ASSESSMENT AREA RATING: (check appropriate category based on the criteria outlined above)

Category: 21 2 3 4

Appendix B Waterbody Data and Categorization Form

Even if all or part of a waterbody is being rated as part of a wetland Assessment Area, it should also be rated separately on this form. Evaluate any waterbody that lies within your project's potential direct or indirect effect area, extending at least as far as the project's right-of-way limits.

The landward extent of the waterbody is the Ordinary High Water line for a non-tidal waterbody or the wetland boundary, whichever of those limits is located least landward.

1. Project name and ADOT&PF #:_ Charles Etok Edwardsen Mitigation Bank
2. Waterbody name (if applicable): Project-specific waterbody identifier (if applicable):AA7 - Lakes
 Evaluation date: Mo. 7 Day 28-31 Yr. 2015 4. Evaluator(s) and affiliation: <u>SLI, EKJ: ABR</u> Purpose of evaluation:
Waterbody potentially affected by a proposed project Mitigation waterbody; pre-construction
Mitigation waterbody; post-construction X Other: _ <u>Mitigation waterbody, preservation, with project</u>
6. Waterbody location(s):
Legal: T. 22N R. 17W; S. 4-10,16-18; T. 22N R. 18W; and T N or S; R E or W; S ; <u>Umiat</u> Meridian
Approx. stationing or mileposts or pertinent project component:
Lat/long: 71.2823,-156.5088 Datum: _NAD 83 Nearest community: _Utgiaġvik, AK Watershed: Elson Lagoon - Frontal Beaufort Sea (12th level HUC 190602020105) (smallest named stream), tributary of
Map (#) showing waterbody: Figure 6
 8. Waterbody description: If a pond or lake, total area: <u>723.35</u> acres estimated or measured? (circle one) If a stream: width in project area:feet (avg)feet (range) gradient (% slope):% Diameter and condition of any culverts in the project area on this waterbody:

Describe the waterbody and surrounding land use and habitat types (water source, inlets, outlets, topography, adjacent land uses, relationship to other waterbodies and wetlands): <u>AA consists of four open water lakes of various sizes, surrounded by palustrine depressional</u> sedge wetlands that are semipermanently flooded or palustrine flat seasonally flooded sedge wetlands. <u>One smaller lake on the</u> west side of the project is surrounded by lacustrine fringe (AA6), and is included in that assessment as well.

Briefly describe the condition of the 6th level hydrologic unit subregion with respect to human activities. Estimate the % that is modified, and list the predominant types of modification. <u>At the 6th level hydrologic unit subregion, very little is developed beyond Utgiaġvik, AK (<10%).</u>

9. Classification of Waterbody:

- Is the waterbody a
 - ___ Stream flowing water
 - X Lake larger than 20 acres in size when full of water
 - ____ Pond a still waterbody smaller than 20 acres in size when full, unvegetated or with floating or submerged vegetation

Class (Cowardin)	Water Regime	Modifier (if any)	% of the Waterbody
UN-PUB1H	P/P		100

Abbreviations:

Cowardin Classes (modified): Aquatic Bed (AB), Unvegetated (UN)

Water (Inundation) Regimes (see section 10 and Table 1 in the User's Manual): Permanent/Perennial I(P/P), Seasonal/Intermittent (S/I), Temporary/Ephemeral (T/E)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Artificial (**A**), Beaver-modified (**B**)

- 10. Disturbance of waterbody: Place check marks in the rows below that describe any past or present types of disturbance that may affect the waterbody within the project area. Describe any disturbance below.
 - _____ On the Category 5/Section 303(d) Impaired Waterbodies list (see Appendix I).
 - _____ Receives potentially low-quality runoff from development within the project area.
 - _____ Receives potentially low-quality runoff as non-point discharges from human activities upstream.
 - _____ Pipes discharge water from human developments upstream of, or within, the project area.
 - _____ Within the project area, the waterbody's banks or bed have been altered by grading, re-routing, placement of fill, excavation, or similar activities.
 - ____ The hydrologic regime has been altered by upstream developments (extensive storm drain systems, water withdrawals, a dam, etc.).
 - _____ The banks or bed are mildly altered by human activities such as trampling, removal of some vegetation, building or clearing to the top of bank.
 - The waterbody has been affected by disturbance such as described above, but it has physically regained some features of natural banks or bed ("naturalized") such as development of pools and riffles, slight sinuosity, vertical or overhanging banks, overhanging vegetation.
 - ____ Known or suspected to contain invasive or exotic plants or animals anywhere in the waterbody. (See User's manual Appendix F for noxious and invasive plant information and Appendix G for a list of invasive animal species.) Write NA if not within your expertise.
 - ____ Disturbance other than described above.
 - X None of the above; waterbody is in essentially pristine condition.
 - Describe any disturbance (types, age, intensity, source, location):
 - None

List any noxious or invasive plant or animal species in the waterbody (Appendices F and G). If it is not within your expertise to accurately answer this question, or you were unable to investigate this, just cross out this question or record explanatory notes. None

11. Habitat for Federally Listed or Candidate Threatened or Endangered Animals or Other Species of Concern (see Appendix H):

Primary or critical habitat (list species)	0	S	Stellar's Eider
Secondary habitat (list species)	D	S	Spectacled Eider, Polar Bear
Incidental habitat (list species)	D	S	
Sources for documented use (e.g., observ	ations	, record	s, etc): ABR baseline Assessment, BEO Master Plan 2013, Barrov
Comprehensive Plan 2014			

12. Wildlife Habitat:

Evidence of overall wildlife use in/on the waterbody (circle substantial, moderate, or low based on supporting evidence): Substantial (based on any of the following [check]): Minimal (based on any of the following [check]):

- observations of abundant wildlife or high species diversity (during any period)
- X abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ____ presence of extremely limiting habitat features not available in the surrounding area
- X_ interviews with local biologists with knowledge of the AA

- ____ few or no wildlife observed during peak use periods
 - ___ little to no wildlife sign
 - ____ sparse adjacent upland food sources
 - ____ interviews with biologists with knowledge of the AA

(N)

Moderate (based on any of the following [check]):

- ____ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ____ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ____ adequate adjacent upland food sources
- ____ interviews with local biologists with knowledge of the AA

Other special wildlife features not addressed above:

13. Fi	h Habitat: (Answer this if the waterbody is used by fish or the existing situation is "correctable" such that the waterbody could be used	by fish.
	f the waterbody is not used by fish, fish use is not restorable, or is not desired from a management perspective, then circle NA.)	

Is the part of the waterbody within the project area shown in the ADF&G Anadromous Waters Catalog?	Υ
Fish species or groups known or suspected to use the waterbody (any part of it):	

Optimal

Other resident species assumed. None observed in field visit.

Sources used for identifying fish species potentially found in the waterbody:

Aquatic cove	· category (see Table 3)	(circle one):
--------------	--------------	--------------	---------------

(Adequate)

Poor

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Does the waterbody contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for anadromous fish or sport fish? Y

Υ

N

Do noxious or invasive plant species (see **Appendix F**) or invasive fish species (see **Appendix G**) occur in the waterbody (anywhere)? Y(N)

Comments, or refer to section 10 above:

14. Recreation or Subsistence Potential:

Is the waterbody a known or potential recreation site? **() N** Used for subsistence activities? **() N** If 'Yes,' describe (travel, transport, boating, fishing, trail parallels or crosses it, next to a park or camping area, in proximity to where kids play, etc.).

Which best describes the current waterbody ownership in the project area?

____ Public ownership or public easement with general public access (no permission required)

X Private ownership with general public access (no permission required)

_____ Private or public ownership without general public access, or requiring permission for public access

Chart for Assignment of a Waterbody to a Management Category

Determine the appropriate category for the waterbody by working through the chart below. Look at the choices in the first column and choose the one that best describes the waterbody. Then, look at the choices in the second column to the right of the category you chose in column 1; choose the best type from column 2. To the right of that choice, select the best choice from column 3. Continue working to right through the chart until you reach the last column, where the Waterbody Category is assigned.

Waterbody Type		Category				
	Any flowing wa	1				
	Any flowing wa	2				
	stream	open channel— perennial, seasonal, intermittent, temporary, or ephemeral	natural (undisturbed) or naturalized (recovered from disturbance, with natural-like banks, sinuosity, substrate)	supports salmon	1	
				Supports resident and other non-salmon fish species	2	
				Not known or thought to support fish	3	
			Channelized and not naturalized	supports salmon	1	
				does not support salmon	3	
		Originally a stream, now in	4			
Flowing	ditch (originally formed by	ally open channel, supports salmon				
Waterbody	excavation; did not originally	Naturalized, does not support salmon			3	
	replace a stream)	Not nat	4			
	Inactive (abandoned) channel	Seasonally or	same as active channel			
		irregularly (less than annually) connected to active channel that is	Cate	2		
			Cate	3		
			Cate			
			Cate	4		
		No existing connection to an active channel, even at high water			4	
	Any still water candidate thre	1				
	Any still water species or prin	2				
Still Waterbody (pond, lake)		supports salmon	Spawning or rearing in potentially affected area		1	
			Affected area is r	migratory route only	2	
	Other still waterbodies	Supports resident and other non-salmon fish species used for	Spawning or rearing ir	1		
	water DOUIES	subsistence or recreation	Affected area is r	2		
		Supports fish not used by humans			3	
	Does not support fish				3	

Assigned Waterbody Category:

2 3

(1)

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4